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THE KETOGENIC DIET IN THE TREATMENT OF URINARY INFECTIONS OF CHILDHOOD

HENRY F. HELMHOLZ, M.D.
ROCHESTER, MINN.

In former publications [1] attention was called to the curative effect of the ketogenic diet on infections of the urinary tract. Particularly striking has been the success in cases of anomalies of the urinary tract which had proved refractory to other modes of medical treatment. In a study of the literature, I found that Nielson,[2] in 1920, fed a cream mixture in the treatment of urinary infections with good results. He ascribed the beneficial action to the increased acidity of the urine which inhibits the growth of the colon bacillus. In vitro experiments, he stated, showing the growth of colon bacilli at a p_H of 5 cannot disprove the beneficial clinical results of the diet. It is evident, he continued, that it is impossible to cure a patient with urinary retention because the acidity of the urine only inhibits growth, but the inhibition is sufficient in uncomplicated cases to clear the infection.

I have tried to determine the therapeutic factors in the diet. Contrary to Nielson's assumption, I have found that ketonurine [3] has bactericidal properties independent of its p_H. This can be demonstrated experimentally in most specimens of ketonurine with a p_H below 5.5, but not in all. After the ketogenic diet has been continued for some time, the p_H of the urine gradually returns to 6 or above. Practically all specimens giving a strong reaction for diacetic acid in the range from p_H 5.7 to 6.5 have no bactericidal powers.

TECHNIC

The specimens were obtained from female subjects by catheter and from male subjects by having them pass a small amount of urine and then catching the remainder in a sterile pyrex container. The urine was cultured in the laboratory and tested for the presence of diacetic acid, and the p_H was determined by the potentiometer. The urine was kept in the refrigerator. If culture showed that the urine contained organisms, another culture was taken after twenty-four hours. When dealing with bactericidal urine, the second culture was sterile or contained a smaller number of organisms. The p_H was determined in each experiment before the inoculation of urine and after twenty-four hours of incubation.

Five cubic centimeters of ketonurine was placed in a series of pyrex tubes and inoculated with twenty-four hour brain-broth cultures of the organisms to be tested. The inoculations were made with a fine platiniridium wire which was dipped into the brain broth to a depth of about 3 mm. and then gently passed back and forth in the ketonurine. The tube of ketonurine was then thoroughly shaken, and 0.5 cc. was plated in litmus lactose agar. The tubes of urine were incubated for twenty-four hours, in a few instances for a shorter time, and after thorough shaking, plates were again made with litmus lactose agar, 0.5 cc. of urine being used. The number of organisms on the plates was counted after twenty-four hours and checked again after forty-eight hours.

Forty-three specimens of urine from patients in ketosis for treatment of urinary infections were studied. According to the p_H and bactericidal properties the specimens can be divided into three groups (table 1): (1) twenty-four specimens with a p_H ranging from 5.1 to 5.62 had definite bactericidal powers manifested by the killing of all organisms in twenty-four hours in nine specimens, markedly reducing the number of organisms in thirteen and inhibiting growth in two; (2) six specimens were intermediate, with a p_H ranging from 5.33 to 5.57, in which none had definite bactericidal power, and three were indeterminate because of the initial high count of inoculated organisms, and (3) thirteen specimens with a p_H range from 5.7 to 6.65; three of these were undetermined, and the remainder had neither bactericidal nor bacteriostatic activity.

As may be noted in table 1, ketonurine with a p_H of 5.6 or less, generally has bactericidal power, and urine with an initial p_H above 5.7 does not have antiseptic properties.

The effect of relatively low urinary acidity on various microorganisms was determined. Such urine was obtained after the ingestion of large doses of ammonium chloride. Specimens of urine with a p_H of 4.8, 4.9, 5.2, 5.38 and 5.6 were inoculated with Staphylococcus albus, Escherichia communior, Escherichia coli, Aerobacter aerogenes, Proteus vulgaris, Salmonella paratyphi and Salmonella schotmuelleri. At the end of twenty-four hours there was marked growth in all tubes when the plates were compared with those made immediately after inoculation. The urine was adjusted with tenth-normal hydrochloric acid to p_H 4.6, 4.4 and 4.2. Proteus vulgaris and Escherichia communior were killed off at p_H 4.6 in twenty-four hours and Escherichia coli at p_H 4.4; Aerobacter aerogenes still grew luxuriantly at p_H 4.2. Table 2 shows the striking bactericidal power of ketonurine at p_H 5.6 as compared with the action of acidity alone at p_H 4.8, 4.6, 4.4 and 4.2. A second experiment demonstrated the effect of ketonurine at p_H 5.32 on bacterial growth, as compared with

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1. Helmholz, H. F.: The Ketogenic Diet in the Treatment of Pyuria of Children with Anomalies of the Urinary Tract, Proc. Staff Meet., Mayo Clin. **6**: 609-613 (Oct. 14) 1931; The Use of the Ketogenic Diet in the Treatment of Urinary Infections in Childhood, Acta pædiat. **13**: 195, 1932. Clark, A. L.: Escherichia Coli Bacilluria Under Ketogenic Treatment, Proc. Staff Meet. Mayo Clin. **6**: 605-608 (Oct. 14) 1931.
2. Nielson, Ove: The Treatment of Urinary Infections, Ugeskr. f. Laeger. **90**: 843-844 (Aug.) 1920.
3. Condition of the urine after the administration of a ketogenic diet.

normal urine at p_H 4.98. Streptococcus lactis, Proteus vulgaris, Aerobacter aerogenes and a mixed culture from an infected kidney were used. The control showed innumerable organisms in all tubes after twenty-four hours, whereas the ketonurine had rendered sterile the tubes inoculated with Streptococcus lactis and the mixed culture, and had markedly reduced the number of organisms in the tubes containing Aerobacter aerogenes and Proteus vulgaris.

TABLE 1.—*Bactericidal Properties of Ketonurine*

Specimens	p_H Before Inoculation	p_H After Twenty-Four Hours	Organisms After Twenty-Four Hours in 0.5 Cc. None	Markedly Reduced	Same	Innumerable	Undetermined
24	5.1 to 5.62	5.2 to 6.27	9	13	2	0	0
	5.57	5.67					
	5.33	5.61					
	5.37	5.74					
6	5.54	6.05	0	0	0	3	3
	5.52	7.07					
	5.35	5.56					
13	5.7 to 6.65	5.9 to 8.4	0	0	0	10	3

Some specimens of urine heavily inoculated became sterile in twenty-four hours. Experiments were carried out in which the urine was cultured repeatedly during the twenty-four hour period after inoculation. In seven of the eleven experiments the urine was sterile after twenty-four hours; in the other four, from four to ninety-five organisms were present in 0.5 cc. In none of the experiments was the number of bacteria reduced after two hours. After four hours one specimen of urine with a very light inoculation was sterile. After six hours, one additional specimen of urine was sterile, and in another experiment, only a single colony appeared on the plate inoculated with 0.5 cc. One other specimen of urine was sterile after twelve hours. Three were not sterile until the end of the twenty-four hour period. The most striking experiment is illustrated in table 3.

TABLE 2.—*Bactericidal Effect of Ketonurine at p_H 5.6 Growth in Control Urine of Lower p_H*

Control Urine	Colonies: Escherichia Coli Before	Escherichia Coli After Twenty-Four Hours	Escherichia Communior Before	Escherichia Communior After Twenty-Four Hours	Aerobacter Aerogenes Before	Aerobacter Aerogenes After Twenty-Four Hours	Proteus Vulgaris Before	Proteus Vulgaris After Twenty-Four Hours
p_H 4.2 adjusted	100	None	100	None	100	Innumerable	Innumerable	None
p_H 4.4 adjusted	250	None	100	None	500	None	Innumerable	None
p_H 4.6 adjusted	300	Innumerable	400	None	750	Innumerable	Innumerable	None
p_H 4.8	100	Innumerable	500	Innumerable	200	Innumerable	Innumerable	Innumerable
Ketonurine p_H 5.6	200	None	600	None	800	None	Innumerable	None

In table 1 it is seen that the urine with a p_H of 4.98 rendered sterile in twenty-four hours the tubes inoculated with Streptococcus lactis and the mixed culture, and markedly reduced the number of organisms in the tubes containing Aerobacter aerogenes and Proteus vulgaris.

These experiments demonstrated that acidity cannot be the sole reason for the bactericidal action of ketonurine. But it is of importance, since urine showing a 4 + reaction for diacetic acid, when the p_H is 5.7 or more, is not bactericidal, as may be seen in group 3 of table 1. This indicates also that diacetic acid or its salts are not concerned with the bactericidal activity. Further support for the inactivity of diacetic acid was furnished by a series of experiments in which 1 cc. of a 5 per cent solution of diacetic acid or sodium diacetate was added to 9 cc. of urine and the p_H was adjusted to between 4.9 and 5.5. In a series of ten experiments there was complete absence of any retardation of bacterial growth in urine, and bacteriostasis occurred in only a single experiment. In order to determine the effect of these two substances on various organisms, a series of experiments was performed with colon bacillus, staphylococcus, Streptococcus lactis, Proteus vulgaris and Aerobacter aerogenes.

Two controls were used, normal urine with a p_H of 4.93 and ketonurine with a p_H of 5.49 and 5.32. The p_H of the urine containing the sodium diacetate in 0.5 per cent concentration had a p_H of 5.23, and the urine with 0.5 per cent diacetic acid, a p_H of 4.95. As may be seen in table 4, there was active growth during the twenty-four hours of incubation in all the specimens of urine containing the sodium diacetate or the diacetic acid and also in the acid control with a p_H of 4.93. The specimen of ketonurine was sterile in the tube inoculated with staphylococci and Streptococcus lactis, and there was a marked reduction in the tubes inoculated with colon bacillus, Aerobacter aerogenes and Proteus vulgaris.

TABLE 3.—*Rapid Bactericidal Action of Ketonurine*

Urine	p_H	Colonies of Colon Bacillus	Colonies of Staphylococcus
At beginning	5.54	220	360
After six hours	....	0	1
After twelve hours	....	0	0
After eighteen hours	6.27	0	0

TABLE 4.—*The Bactericidal Effect of Ketonurine with Acidity, Diacetic Acid and Sodium Diacetate Controls*

	Control Urine: Colon Bacillus	Staphylococcus	Streptococcus Lactis	Proteus Vulgaris	Aerobacter Aerogenes
p_H before inoculation	4.93	4.93	4.98	4.98	4.98
p_H after 24 hours' incubation	4.83	4.80	5.07	5.07	5.6
Colonies after inoculation	975	650	750	8,740	975
Colonies after 24 hrs.' incubation	*	*	*	*	*
Diacetic acid test	0	0	0	0	0
After 24 hours' incubation	0	0	0	0	0
Urine with 0.5 per Cent Sodium Diacetate					
p_H before inoculation	5.23	5.23	5.23	5.23	5.23
p_H after 24 hours' incubation	7.35	7.34	6.2	7.4	6.32
Colonies after inoculation	910	520	585	400	960
Colonies after 24 hrs.' incubation	*	*	*	*	*
Diacetic acid test	++++	++++	++++	++++	++++
After 24 hours' incubation	++++	++++	++++	++++	++++
Urine with 0.5 per Cent Diacetic Acid					
p_H before inoculation	4.95	4.95	5.17	5.17	5.17
p_H after 24 hours' incubation	4.51	6.22	5.97	8.21	5.97
Colonies after inoculation	390	1,300	910	50	*
Colonies after 24 hrs.' incubation	*	*	*	*	*
Diacetic acid test	++++	++++	++++	++++	++++
After 24 hours' incubation	++++	++++	++++	++++	++++
Ketonurine					
p_H before inoculation	5.49	5.49	5.32	5.32	5.32
p_H after 24 hours' incubation	5.58	5.64	5.59	5.62	5.61
Colonies after inoculation	940	910	650	240	110
Colonies after 24 hrs.' incubation	40	0	0	50	12
Diacetic acid test	++++	++++	++++	++++	++++
After 24 hours' incubation	++++	++++	++++	++++	++++

* Innumerable.

It would seem that acidity alone or in combination with diacetic acid or sodium diacetate is not responsible for the bactericidal effect, but that some other substance or substances in the ketonurine acts antiseptically at a low p_H.

The clinical application of the ketogenic diet has been successful. The diet has been so generally used in the treatment of epilepsy that it is hardly necessary to indicate to the pediatrician how it is carried out. For the urologist it is, no doubt, a new procedure. The patient is given about 50 calories for each kilogram of body weight and 1 Gm. of protein for each kilogram. For a child weighing 30 Kg., the diet starts with 30 Gm. (120 calories) of protein, 70 Gm. (280 calories) of carbohydrate and the remainder up to 1,500 calories in fat (120 Gm.). The second day the carbohydrate is reduced to 50 Gm., and the fat is correspondingly increased; on the third day only 30 Gm. of carbohydrate is given, with a further increase in fat to match the calories; on the fourth day only 20 Gm., on the fifth 15 Gm. and on the sixth 10 Gm. is given. This is usually sufficient to insure ketosis, as indicated by a strongly positive diacetic acid reaction and in most instances a p_H well below 5.5. It may take a few days to bring this about. If not, the addition of from 1 to 3 Gm. of ammonium chloride a day will reduce the p_H to the desired range. This should result in sterilization of the urine in from five to ten days.

TABLE 5.—*Treatment with Ketogenic Diet in Absence of Anomalies*

Age, Years	Organism	Pus in Urine, Graded 1 to 4	Days on Diet	Interval of Days Between First Ketosis and Sterilization of Urine	Days After Stopping Diet; Culture of Urine Sterile	Relapse	Comment
10	Colon bacillus	3	10	6	4	+	Streptococcus lactis cultured during relapse
12	Colon bacillus	4	23	6	5	0	
9	Colon bacillus	4	33	?	20	0	
10	Colon bacillus	4	12	8	23	0	
13	Staphylococcus	4	22	6	14	0	
8	Proteus vulgaris	4	14	..	..	0	Third day of ketosis p_H 5.6, 400 organisms for each 0.5 cc.; fifth day of ketosis p_H 5.6, 100 organisms for each 0.5 cc.; eighth day of ketosis p_H 6.1, innumerable organisms for each 0.5 cc.

The diet has been the means of clearing the urinary infection in eight of the nine cases; three of the cases were major urinary anomalies associated with retention. Table 5 contains the details of the six cases in which urinary anomalies were not present. The case in which the urinary infection was not cured was that of a boy with hypospadia and infection due to Proteus vulgaris. In this case, as long as the p_H was 5.6 there was a marked reduction in the number of organisms in the urine. When the p_H rose to 6.1, the organisms became innumerable. At the time this patient was treated, the importance of a low p_H was not fully appreciated. Two patients became reinfected, but in both the infection was with a different organism. Abstracts of three cases of urinary anomaly are reported.

ABSTRACTS OF CASES

CASE 1.—A boy, aged 8 years, had had chronic infection of the urinary tract with recurring attacks of high fever for an unknown period. Albuminuria and pus were graded 1. Innumerable gram-negative bacilli were found on culture. The concentration of urea was 24 mg. in each 100 cc. of blood, and the return of phenolsulphonphthalein in the urine was 55 per cent in two hours. The cystogram did not show reflux into the ureters. Numerous attacks of left renal colic had occurred. An intravenous urogram disclosed dilatation graded 3 of the pelvis and calices of the left kidney (fig. 1). The ureters below the ureteropelvic juncture were free from contrast medium. Treatment was diamino 4-ethoxyazobenzene and methenamine and ammonium chloride was tried without relief. The infection cleared rapidly with the patient on the ketogenic diet (case 1, table 6).

CASE 2.—A girl, aged 9 years, had had pyelitis three years before examination. Cystoscopic examination and ureteral catheterization had resulted in improvement, but cure had not been obtained. In June, 1931, there was recurrence of pain and fever with pus in the urine graded 4. Examination disclosed albuminuria, graded 2, and pyuria, graded 4. Cultures of urine from the bladder and both ureters showed innumerable colonies of Streptococcus haemolyticus. The tuberculin test gave negative results. The kidneys and bladder were normal on roentgenologic examination. The concentration of urea was 22 mg. in each 100 cc. of blood; the return of phenolsulphonphthalein in the urine was 50 per cent in two hours. Cystoscopic examination showed diffuse cystitis. Retrograde and intravenous pyelograms showed bilateral pyelonephritis, bilateral hydronephrosis and hydro-ureter with probable duplication of the ureter on the left. Treatment with ammonium

TABLE 6.—*Summary of Cases*

	Date	Diet, Gm. Carbohydrate	Protein	Fat	Diacetic Acid	Urine, p_H	Bacteria in 0.5 Cc. of Urine	Pus, Graded	Comment
Case 1: hydronephrosis (boy, aged 8 years)	9/11/31	75	25	100	None	...	Innumerable	1	Colon bacillus
	9/12/31	50	25	110	++	...	.....	..	Patient vomited
	9/13/31	30	25	120	.....	...	Few		
	9/14/31	25	25	130	+++	5.5	None		
	9/16/31	15	25	130	++++	5.4	None		
	9/21/31		Off diet 2 days		.....	6.4	None		
	9/23/31		Off diet 4 days		.....	...	4		Renal colic, hematuria, organism cocci
	9/30/31		Off diet 11 days		.....	...	None		
Case 2: bilateral hydronephrosis, double ureter on left side (girl, aged 9 years)	9/ 7/31	..	..	...	None	...	Innumerable	4	Streptococcus hemolyticus
	9/16/31	..	..	...	None	...	Innumerable		
	9/18/31	70	30	120	None	...			
	9/21/31	20	30	135	+	5.8	None		
	9/22/31	15	30	140	++	5.4	None	1	
	9/23/31	15	30	140	++++	5.1	None	..	2 cc. of urine used in cultures
	9/24/31	15	30	140	++++	5.0	None	..	2 cc. of urine used in cultures
Case 3: hydronephrosis (girl, aged 7 years)	12/12/31	65	26	100	None	...	Innumerable	4	Colon bacillus
	12/16/31	15	26	140	+	5.0	Innumerable	2	
	12/17/31	15	26	140	++	5.3	100	2	
	12/18/31	15	26	140	+++	5.3	200	1	
	12/21/31	15	26	155	+++	5.3	None	Occasional cell	
	12/24/31	20	30	170	+++	5.2	None	Occasional cell	
	12/26/31	45	30	150	None	5.5	None		
	12/28/31	85	35	100	None	8.4	None	Occasional cell	
	12/30/31	85	35	100	None	8.0	None		

chloride and methenamine was a failure. The child was placed on the diet, and the pus and streptococcus disappeared rapidly from the urine (case 2, table 6).

CASE 3.—A girl, aged 7 years, suffered from pyuria, fever, pains in the right side and diurnal enuresis. In December, 1930, headache and fever appeared. In February, 1931, the child was acutely ill, with a fever of 105 F. There was severe pain in the right side, frequency and urgency. A cystoscopic examination in April, 1931, resulted in a diagnosis of hydronephrosis. In July, 1931, the right ureter was dilated without benefit, and nephrectomy was considered. Another attack of pain and fever occurred in October with massive amounts of pus in the urine. Roentgenograms of the kidneys, ureters and bladder gave negative results. The return of phenolsulphonphthalein in the urine was 50 per cent in two hours; the concentration of urea was 28 mg. in each 100 cc. of blood; albumin was graded 1, and pus was graded 2. Culture showed innumerable colonies of colon bacilli. Urographic studies disclosed right hydronephrosis, probably obstruction of the ureteropelvic juncture. On November 24, right nephropexy and temporary nephrostomy were performed, and the surgeon made the following statement: "If operation does not relieve the infection of the kidney and pelvis, nephrectomy will be advisable." The child was returned to the medical service after operation, with a normal temperature. Five-tenths cubic centimeter of urine contained pus graded 4 and innumerable colon bacilli. The patient was placed on the diet, and the infection disappeared in a period of about ten days (case 3, table 6).

Fig. 1.—Intravenous urogram; left hydronephrosis.

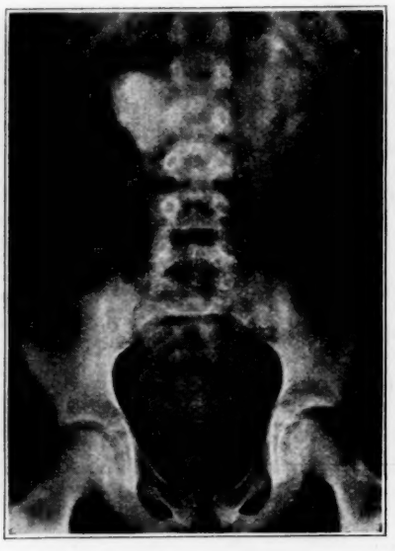

Fig. 2.—Intravenous urogram; bilateral hydronephrosis. Double ureter (left).

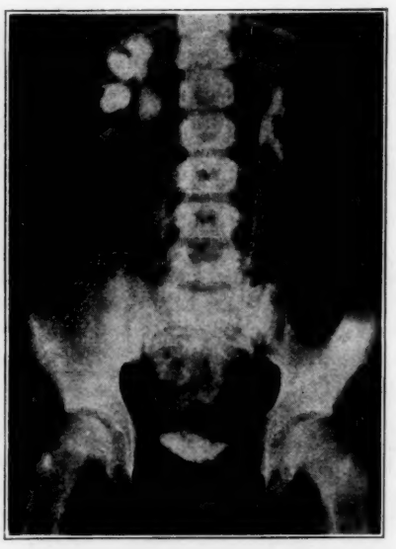

Fig. 3.—Intravenous urogram; hydronephrosis, right.

SUMMARY

By the use of the ketogenic diet the urine can usually be rendered bactericidal when its p_H is below 5.6.

The bactericidal power apparently is not due to acidity alone or to the presence of diacetic acid or sodium diacetone. Acidity in synergy with substances hitherto not yet determined probably accounts for this bactericidal action.

Ketonurine of a p_H of 5.5 is an excellent antiseptic for clearing urinary infections, and ketonuria should prove useful in the preparation of patients for operation on the urinary tract.

By means of the ketogenic diet three patients with major urinary anomalies have been freed from infection. At the Mayo Clinic no other method of treatment has been successful in this type of case. The clearing of an infection by means of the diet does not necessarily mean permanent cure.

ABSTRACT OF DISCUSSION

DR. CLIFFORD G. GRULEE, Chicago: I have tried the ketogenic diet in a few cases. While I haven't followed them up in anything like the way in which Dr. Helmholz has, my impression is that it is quite a successful form of treatment. I have, however, had one child who had a chronic infectious condition for several months as the result of a malformation, who did not respond to the treatment and in whom another form was tried; immediately the number of cells in the urine increased markedly, so the child was put back on the ketogenic diet with the hope that the infection might be reduced still further. A word of caution might be offered here. There are two things that are possibilities in this connection. One is that a ketogenic diet may cause at times some disturbance in the organism. I have in mind the case of one of my confrères who had a child on a ketogenic diet; during the process of treatment the child developed an acute appendicitis. Following the removal of the appendix, the child became quite acidotic. Whether this was the result of the ketogenic diet or not, he was not able to determine and neither was I. But it is a possibility that under such circumstances one must be cautious about the use of the ketogenic diet. It is, of course, well known that the acute infections of the urinary tract occur largely in infants much more than in older children. In infants the use of the ketogenic diet is rather hard. The general condition of the child must be thought of first. Often the ketogenic diet might have an adverse effect on the nutrition of the child.

DR. FRED W. SCHLUTZ, Chicago: My experience with this interesting form of treatment suggested by Dr. Helmholz has so far been rather limited. I have the impression, from the experience I have had, that it is particularly efficacious in chronic pyelocystitis, a condition which has been so disappointing with the usual forms of treatment up to the present time. It has been particularly efficacious in some cases of anomaly of the urinary tract, in which the cystitis forms one of the most distressing and persisting symptoms. These patients get relief in a way that one cannot give them with any other form of treatment. I have the impression that in the acute form some of the usual methods that have been used in the past are probably fully as satisfactory and possibly a little more rapid than the ketogenic diet. So far I have not had quite as favorable an experience as Dr. Helmholz has mentioned. It is an interesting contribution and opens up splendid possibilities. It probably will prove to be one of the most effective additions to the armamentarium in the treatment of this disease, particularly the chronic forms.

DR. HARRY LOWENBURG, Philadelphia: It is well known that, in acute infections of childhood, ketonuria is a frequent

symptom. This is also true of acute febrile pyuria (so-called pyelitis). Therefore one could expect these cases to be self-curing or self-limited on this account. Also, if not, would the ketogenic diet, with its excessive fat feeding, be applicable to very young infants or in many of these acute cases, which present extreme toxicity, with vomiting, anorexia, and hyperpyrexia as their main and early symptoms? I doubt the practical applicability of this method in cases of this sort despite its apparent value in chronic pyurias.

DR. C. ULYSSES MOORE, Portland, Ore.: Does Dr. Helmholz estimate the p_H on a twenty-four hour urine specimen? If so, what preservative is used?

DR. HENRY F. HELMHOLZ, Rochester, Minn.: At the present time I think the use of the diet should be limited to the treatment of chronic cases, at least cases in the subacute state. I feel, however, that probably in attempting to alkalize the urine rather than to acidify it we have overlooked our best bet with regard to any effect of either alkalinity or acidity. So that even in the acute cases, as a number of Norwegian observers have shown, it is possible to sterilize the urine with a p_H of 5. We have never observed any bactericidal action in urine of p_H 5, but apparently it is possible by washing out the infection to influence a urinary infection. Dr. Clark of our clinic has studied the diet in relation to infections in adults. It has been found that, when there are marked renal lesions, the infected kidney not only will not put out a urine of low p_H but it may block the excretion of the acetone body. The presence of ketonuria is not sufficient, as I pointed out. A p_H of 5.6 or below is necessary. With this diet it is easily achieved during the first week or ten days, but then the p_H tends to mount rapidly. I am glad to see that others too have seen beneficial results in cases with urinary anomalies. It would seem that bactericidal urine can be obtained in this way, and one should be able to sterilize the urine in these cases of obstruction, because one is keeping an antiseptic solution in the portion of the urinary tract that is dammed up. With regard to the p_H, I think we have been taking a p_H immediately after the specimen is taken. We usually take a specimen early in the morning. We know that on the diet there is likely to be less diacetic acid in the morning, but we have found that the p_H will run fairly constant on a certain dosage of ammonium chloride if it is continued for too long a period. In other words, the body tends to adjust itself to a certain dose of ammonium chloride. In order to keep the p_H down it may be necessary to increase the dose of ammonium chloride. Taking ammonium chloride ourselves, we have not been able to obtain a p_H of lower level than 4.8, although I think Haldane has reported it down to as low as 4.6.

Coronary Thrombosis.—Coronary thrombosis is the name which has come into use in recent years for the serious heart attack which results from thrombosis in a coronary artery or branch. The series of events following such complete obstruction is known as cardiac infarction, an alternative term with the same clinical meaning as coronary thrombosis. . . . A large branch of a coronary artery, often but by no means exclusively the descending branch of the left coronary, happens to be the seat of a stenosing atheroma which narrows the lumen. At the point of greatest constriction, and perhaps favored by atheromatous ulceration, thrombosis takes place and completely blocks the vessel. The resulting infarct occupies the territory hitherto supplied by that vessel. As the wall of the ventricle is thus involved, it may be that the necrotic reaction reaches the endocardium to precipitate an intracardiac thrombus. Less often the process reaches the pericardium to produce a patch of pericarditis over the infarct (infarct-pericarditis). Such is a usual postmortem finding when sufficient time has elapsed before death for the infarct to form. On the other hand, an infarct may result from extreme coronary narrowing without the complete occlusion of actual thrombosis and yet produce all the symptoms of "coronary thrombosis." Syphilitic stenosis of both orifices may give the same picture. But I wish to leave quickly this aspect of the condition, for we are to deal with the clinical results of infarcts from which patients often recover, a fact only realized in the last decade.—Parkinson, John: Coronary Thrombosis, *Brit. M. J.*, Sept. 17, 1932, page 549.

ADDISON'S DISEASE

FURTHER REPORT ON TREATMENT WITH "INTERRENALIN" (ADRENAL CORTICAL EXTRACT)

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For the past five years I have employed an extract, representing the active substance or hormone (interrenalin) of the adrenal [1] cortex, in the treatment of Addison's disease. Sixty-two cases have come under my observation for study and treatment. This has enabled me to correlate clinical observations with my studies on adrenal insufficiency in experimental animals.

In 1929, Stewart and I [2] published a preliminary report on the treatment of Addison's disease by oral administration of extracts prepared from the cortical layer (interrenal gland substance) of adrenal glands. At that time we reported our observations on seven patients who had been receiving "interrenalin" for periods up to about one and one-half years. In 1930, I [3] compared the periods of survival and clinical courses of these patients with those of patients that had not received adrenal extract. The contrast was sufficiently great to demonstrate superiority of this treatment over others hitherto employed. One of the patients is still under observation; two others succumbed quite recently. Cases 1 to 7 inclusive, in table 1, represent those reported by us in 1929. Continued observations on some of these patients and further experience with a number of additional cases justifies another communication at this time.

CLINICAL RESULTS

Nearly all the sixty-two cases were referred to me, for study and treatment, with the diagnosis of Addison's disease. In most cases the diagnosis was made by more than one physician. In this report, however, I shall include only those cases in which the diagnosis left no room for doubt, or in which confirmation was obtained at autopsy. Of these, there were twenty-one cases that were treated with interrenalin (group 1). Twelve patients that did not receive interrenalin (group 2) serve as controls, for comparison with the first group. A third group includes the rest of the cases. Clinically, and for the purpose of treatment, most of the cases in this group warrant the diagnosis of Addison's disease, but I have excluded them as lacking some of the classic symptoms which would render the diagnosis unquestionable. There is no doubt that some of them are cases of genuine Addison's disease, some perhaps in earlier stages, while others may be classed clinically as functional adrenal cortical insufficiency. A few of the cases I hesitated to include in either category.

By excluding group 3, the possibility of overestimating the efficacy of the adrenal extract is avoided. This, also, renders the test very severe and much more reliable, since group 1 represents only well advanced cases, the classic symptoms of the disease already being

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1. The name "suprarenal" is appropriate only when referring to the gland in human beings. In animals (with the possible exception of some monkeys) "adrenal" designates, more correctly, these organs. Since the name adrenal may also be properly employed in cases in which the gland rests above the kidney, I have preferred to use it, throughout this article, instead of suprarenal.

2. Rogoff, J. M., and Stewart, G. N.: Suprarenal Cortical Extracts in Suprarenal Insufficiency (Addison's Disease), J. A. M. A. **92**: 1569 (May 11) 1929.

3. (*a*) Rogoff, J. M.: Clinical and Experimental Studies on Adrenal Insufficiency and Addison's Disease and the Treatment of Such Conditions by Interrenalin, Proc. California Acad. Med., 1930; (*b*) Diagnosis and Treatment of Addison's Disease, Canad. M. A. J. **24**: 43 (Jan.) 1931.

fully developed. It may be stated, however, that considerable improvement and relief of those symptoms that suggested Addison's disease were observed in the cases of group 3 that were treated with interrenalin. To facilitate comparison, the cases in groups 1 and 2 are presented in tabular form. For the present purpose, of the earliest symptoms which can be definitely associated with lack of adrenal cortical function.

More extensive discussion of the clinical and postmortem observations is reserved for another paper, to be published later. The number of autopsies obtained, in both groups, is quite satisfactory in view of the fact

TABLE 1.—*Cases of Addison's Disease (Group 1) Treated with Interrenalin*

Case	Sex*	Age, Years	Onset of Symptoms	Clinical Course Before Interrenalin	Interrenalin Treatment Begun	Progress Following Interrenalin	Maximum Increase B. P. (Systolic) Mm.	Duration, Years	Adrenal Glands	Comment
1	♂	40	Spring, 1925	Gradual decline	December, 1927	Gradual, sustained improvement	25	7½	.....	Treatment discontinued about a year; condition good; working regularly
2	♂	48	Spring, 1927	Rapid decline	April, 1928	Gradual, sustained improvement	15	2½	No autopsy	Extraction of teeth (probably anesthetic) fatal
3	♀	28	Fall, 1926	Progressive decline	March, 1928	Sustained improvement	30	5½	Extreme atrophy of both glands	Recently, acute symptoms developed at intervals; relieved by intravenous saline solution; exacerbation fatal, July 22, 1932
4	♀	26	Fall, 1925	Rapid decline	November, 1927	Sustained improvement	20	3	Extreme atrophy of both glands	Treatment discontinued five months; acute exacerbation fatal
5	♀	49	1927	Rapid decline	April, 1928	Improvement	..	2	Tumor (malignant ?)	Interrenalin supplied during only two months
6	♂	46	Spring, 1927	Progressive decline	September, 1928	Gradual, sustained improvement	15	5	No autopsy	Tuberculous testicle excised, February, 1929; resumed work in store; recent acute exacerbation fatal
7	♂	19	May, 1928	Rapid decline	November, 1928	Marked improvement	30	1	No autopsy	Influenza fatal
8	♂	26	Spring, 1928	Progressive decline	April, 1929	Moderate improvement	25	2	Right calcified; left extensive atrophy and fibrosis	Improvement not sustained
9	♂	50	Fall, 1926	Gradual decline	May, 1928	Slight improvement	15	2	No autopsy	Improvement not sustained
10	♂	64	April, 1928	Gradual decline	January, 1929	Gradual, sustained improvement	15	4	.....	Treatment discontinued over a year; resumed usual occupation
11	♂	32	Spring, 1928	Gradual decline	June, 1929	Gradual improvement	25	2½	Right caseous degeneration; left caseous and calcareous degeneration	Intravenous saline solution at intervals after acute exacerbation
12	♂	30	October, 1927	Rapid decline	June, 1929	Marked improvement	25	3	Extreme atrophy of both glands	Traveled from North Carolina to New York; exacerbation resulted fatally; had pulmonary tuberculosis in 1925
13	♂	39	Spring, 1927	Gradual decline	March, 1929	Rapid improvement	30	4½	No autopsy	Treatment intermitted last six months; returned to work more than one year; acute exacerbation fatal
14	♀	56	Spring, 1929	Rapid decline	September, 1929	Slight improvement	10	1½	Granulomatous degeneration of both glands	Ephedrine caused serious aggravation of acute symptoms; intravenous saline solution only slightly beneficial
15	♀	35	Fall, 1929	Rapid decline	April, 1931	Moderate improvement	20	2	Extreme atrophy and fibrosis of both glands	Spectacular resuscitation from coma by intravenous saline solution; improvement not sustained
16	♀	57	February, 1931	Rapid decline	October, 1931	Slight improvement	25	1	Extensive tuberculous degeneration of both glands	Benefit from intravenous saline solution not sustained
17	♂	38	Summer, 1929	Rapid decline	May, 1930	Decided improvement	25	...	.....	Saline injections at intervals; left city after about a year; further information lacking
18	♂	40	Spring, 1928	Progressive decline	April, 1929	Slight improvement	†	4½	.....	Complicated by nephritis, possibly of syphilitic origin
19	♀	38	February, 1930	Rapid decline	November, 1931	Rapid improvement	30	2½	No autopsy	Saline injections at intervals; bronchopneumonia with recovery four months before final acute exacerbation
20	♂	27	Fall, 1931	Rapid decline	April, 1932	Rapid improvement	30	...	.....	Has tuberculous knee joint; receiving saline injections at intervals
21	♀	49	Fall, 1930	Gradual decline	February, 1932	Slight improvement	15	...	.....	Interrenalin two months, discontinued and then resumed in July

* In the tables, ♂ denotes male; ♀, female.

† Systolic blood pressure, in case 18, ranged from 120 to 160 mm., according to the severity of the renal condition. While Addison's disease had been diagnosed as of syphilitic origin, more recent studies leave some doubt. The case is included because if it should prove to be Addison's disease it will be the only case of adrenal syphilis in this series.

the important information is obtained by comparing the duration of survival of the patients receiving an extract (table 1) with those not treated with interrenalin (table 2). These are given in the columns headed "duration." The number of cases in either group is too small to rely on averages. The duration of the disease is determined from the period of onset that only a few of the cases [4] were observed in Cleveland hospitals. From earlier experiences, I was convinced that the fatigue of travel is too dangerous a

4. For these I am indebted for valuable coöperation to the late Drs. C. F. Hoover and John Phillips, Drs. Richard Dexter and Harry Paryzek of St. Alexis Hospital, Drs. Marion Blankenhorn and C. D. Christie of Lakeside Hospital, Dr. G. W. Crile of the Cleveland Clinic and Dr. R. G. Pearce of the Akron Clinic. I am indebted, also, to a number of other colleagues who referred their cases to me for study.

strain to impose on a sufferer with Addison's disease. In out of town cases, therefore, I have preferred to visit the patient and manage the case at the patient's home with the cooperation of the attending physician. This may, in part, explain the much better results obtained in my group of cases than is apparent from a number of reports that have recently been published by other authors on the use of adrenal extracts in Addison's disease.

The only reliable criterion for potency of an adrenal cortical extract at present available is its capacity to prolong life and good health in completely adrenalectomized animals (which do not possess accessory interrenal gland tissue). Consequently, the only reliable criterion for its efficacy in Addison's disease is its capacity to prolong life in patients with the disease. Amelioration of symptoms, though an important effect of such an extract, can have special significance only when it is demonstrated that the extract can compensate for loss of adrenal cortical function, by prolonging life. Accordingly, the clinical evidence in this article is presented chiefly with the view of determining the value of adrenal cortical extract in prolonging life and secondarily in ameliorating symptoms in Addison's disease. Not only is there a decided increase in the survival period of most patients receiving interrenalin, but nearly all of them obtained definite relief from the usual symptoms (even in cases in which life was not appreciably prolonged). This is in harmony with the observations in experimental animals.[5]

The accompanying tables illustrate the following observations: Of the twenty-one cases treated with interrenalin, included in table 1, there are thirteen males and eight females. The ages of the patients range from 19 to 64 years. In a large majority of the cases other forms of treatment had been unsuccessfully employed before they were referred to me for study and treatment with interrenalin. Five patients (1, 10, 18, 20 and 21) are still under observation, the last two being under treatment too short a period to permit more than the mention of amelioration of symptoms. Three patients died of intercurrent conditions. Comparing the life span of the patients in table 1 with those in table 2 (under "duration") it is observed that eleven patients in group 1 exceeded and four others attained the maximum period of survival of those in group 2. Of these, three are still living (1, 10 and 18). Confirmation of the diagnosis was obtained by postmortem examination in nine out of fifteen deceased patients. Four of the nine exceeded the maximum duration of the patients that did not receive interrenalin.

Table 2 compares well with a similar table containing the original cases reported by Thomas Addison and published by me in an earlier paper [3a] demonstrating the survival period in addisonian patients not treated with potent adrenal cortical extracts. Examination of reliable records from other sources, e. g., Kovács,[6] and others, shows that very few attain a maximum duration of two years. Only one case in group 2 and one case in Addison's series attained this maximum. It is, of course, possible that tuberculosis or other underlying factors may exist for many years and, indeed, may present some of the symptoms of Addison's disease. Autopsy in such a case may reveal adrenal degeneration, but it would be doubtful whether extensive adrenal degeneration, sufficient to lead to Addison's disease, could have existed longer than the last few months of survival. There are four males and eight females in the group comprising table 2, and the ages range from 20 to 50 years. Nearly all of them were treated by methods ordinarily employed in Addison's disease other than the procedure that I employed in the cases in which interrenalin was administered, presented in table 1.

Conservative appraisal of the data obtained in this series of cases leaves no doubt that interrenalin administered orally, in the form of extracts made from the cortex (interrenal gland substance) of adrenal glands, is effective in prolonging life and relieving symptoms in advanced Addison's disease. Permanent relief or "cure," however, should not be expected, even if the pure cortical hormone were available, unless the underlying cause of the disease has subsided before extensive degeneration of the adrenal glands has occurred and the necessary conditions for cortical regeneration still exist. This appears to be the case in patients 1 and 10 (table 1), but it would be risky to assume that active symptoms might not again develop at any time.

The important problem concerning Addison's disease is the elaboration of information that will permit positive diagnosis of adrenal insufficiency to be made much earlier than is now possible. When this will have

TABLE 2.—*Cases of Addison's Disease (Group 2) Not Treated with Interrenalin*

Case	Sex	Age, Years	Clinical Course	Duration, Years	Adrenal Glands	Comment
1	♂	35	Gradual decline	1½	Atrophy and caseous degeneration	Had tuberculous hip and spine
2	♀	41	Progressive decline	1	No autopsy	Had tuberculous hip joint
3	♀	25	Gradual decline	2	Extreme atrophy of both glands	Epinephrine and saline injections without sustained benefit
4	♀	50	Progressive decline	1¼	No autopsy	Muirhead treatment and thyroid medication without benefit
5	♀	43	Rapid decline	1	No autopsy	Muirhead treatment without benefit
6	♀	36	Very rapid decline	½	Complete fibrosis of both glands	
7	♀	40	Gradual decline	1½	Extensive tuberculous hyalinization of both glands	Pulmonary tuberculosis
8	♀	39	Very rapid decline	¾	Atrophy and fibrosis of both glands	Muirhead treatment without benefit
9	♀	33	Very rapid decline	1	Extensive atrophy of both glands	
10	♂	45	Rapid decline	¾	Extensive caseation of both glands	Intravenous saline solution during acute exacerbation failed to yield benefit
11	♂	20	Gradual decline	1½	No autopsy	Muirhead treatment without benefit
12	♂	36	Rapid decline	1¼	No autopsy	Epinephrine pituitary gland, thyroid gland and other treatment without benefit

5. Rogoff, J. M., and Stewart, G. N.: The Influence of Adrenal Extracts on the Survival Period of Adrenalectomized Dogs, Science **66**: 327 (Oct. 7) 1927; Am. J. Physiol. **84**: 660 (April) 1928.

6. Kovács, W.: Zur Nebennierenpathologie, Beitr. z. path. Anat. u. z. allg. Path. **79**: 213 (Feb.) 1928.

been accomplished, therapeutic measures can be expected to effect cures in a larger proportion of cases. Regeneration of structure and function of the adrenal glands occurs more readily if degenerative processes have not been too extensive and too progressive. This has been demonstrated in recent experimental work on animals in which I [7] have successfully created, for the first time, chronic lesions of the adrenal glands and clinical phenomena comparable or identical with human Addison's disease. In untreated animals it was found that adrenal degeneration may lead to atrophy of the glands and produce symptoms of chronic cortical insufficiency. In some cases sufficient regeneration may occur to permit the animals to recover normal health and survive indefinitely. In others, temporary recovery is succeeded by further retrograde changes in the adrenals, leading to acute phenomena and a fatal outcome. From these observations it is apparent that if early diagnosis of adrenal insufficiency or Addison's disease could be made with certainty and if the underlying factor can be controlled, it is more probable that cure might be effected by supplying the necessary hormone, to compensate for lack of adrenal cortical function, permitting regeneration of the gland to occur more readily.

DIAGNOSIS

Diagnosis of advanced Addison's disease should present no difficulty. In such cases, e. g., those in table 1, the classic symptoms described by Addison (cardiovascular and muscular asthenia, pigmentation and gastro-intestinal disturbances) are present and usually the history reveals that the patient has experienced one or two characteristic acute exacerbations. Until these conditions are present, diagnosis is rarely made with certainty. From our recent experimental studies on animals, as well as the clinical observations on Addison's disease, some information of diagnostic value has been obtained, and it is to be hoped that further information may be obtained which will make it possible to recognize the disease in the earlier stages of adrenal insufficiency.

In previous communications, I [3] have called attention to two points of diagnostic importance. One of these is aversion to fatty foods. The other symptom is elicited by moderate pressure in the costolumbar angle, causing a dull pain when there is active degeneration of the adrenal gland. In acute conditions, associated with extensive degeneration or inflammation of the gland, the pain radiates toward the pelvis of the same side. Where extensive fibrosis or atrophy of the gland has occurred and acute inflammatory or degenerative processes are absent, this symptom is not obtained. In a number of cases this sign has enabled me to predict the type and extent of degeneration of the glands and the prediction was later confirmed at autopsy. The sign is sometimes present bilaterally in severe cases of exophthalmic goiter but in these cases the pain has not been observed to radiate toward the pelvis. It may also be present in pyelitis or pyelonephrosis. These conditions, however, would not be confused with Addison's disease.

Examination of the blood may reveal nothing abnormal during periods of remission but almost invariably shows an elevation in the total nonprotein nitrogen during or preceding acute phenomena of the disease. When this elevation is high there is also an increase in the urea nitrogen, but it is the so-called undetermined fraction of the nonprotein nitrogen that is the more significant factor in the elevation of the total nonprotein nitrogen. There may be a slight hypoglycemia and there is always some dehydration during acute exacerbations. The chemical changes of the blood in Addison's disease correspond to those which Stewart and I [8] have described as occurring in adrenalectomized animals. They are also similar to the blood changes observed in animals with subacute or chronic adrenal insufficiency, in my recent studies on experimental Addison's disease.[7]

Pigmentation always appears more intense during periods of exacerbation and may vary slightly in intensity during remissions. A point of some significance is the development of small ebony-colored, freckle-like spots which appear most frequently on the neck and forearms. In our experience, these spots have appeared toward the last few months of survival, in most cases. In blonds there may be complete absence of the ordinary diffuse pigmentation, and the appearance of these small spots together with other symptoms would suffice for diagnosis of Addison's disease. Our observations indicate that this disease is much more rapidly fatal in blond individuals. Bluish pigmentation of the margins of the gums, lips, tongue and mucous membrane of the cheeks quite commonly occurs and even in the absence of skin pigmentation, especially in blonds, should be considered of diagnostic importance. Of course, metallic poisoning must be ruled out.

A number of patients have indicated that distress in the joints, especially the knee joints, is not an uncommon occurrence. Others have complained of interscapular, subscapular or lumbar aches. These symptoms may be related to the muscular asthenia. "Creeping sensations" and other nervous phenomena have been experienced by a number of patients. Insomnia and disturbing dreams are common. In more severe states there may be hallucinations, delirium and convulsions, although these are apparently prevented by interrenalin. Among the gastro-intestinal disturbances should be mentioned the occurrence of hiccup. This is common in patients that are developing the intoxication which leads to an acute crisis.

The basal metabolic rate has been relied on by some clinicians in the diagnosis of Addison's disease and as an index to the condition of a patient with this disease. Our experience has led us to regard the basal metabolic rate as of little significance. Patients may have normal or even moderately increased basal metabolic rates in advanced stages of Addison's disease and others or, indeed, the same individuals may present normal or slightly subnormal basal metabolic rates during periods of apparent good health. Diminution of the basal metabolic rate in Addison's disease was suggested from the results obtained by certain investigators on adrenalectomized animals. However, since their animals survived only a short time, the lowered basal metabolic rate can be more properly associated with the moribund state of the animals.

TREATMENT

The treatment of patients with Addison's disease, as employed in the present series of cases, was developed from my experimental studies on animals, in collaboration with the late Prof. G. N. Stewart, extending over a

7. Rogoff, J. M.: Experimental Production of Chronic and Subacute Adrenal Insufficiency in Dogs and Cats, Proc. Soc. Exper. Biol. & Med. **29**: 1240, 1932.

8. Rogoff, J. M., and Stewart, G. N.: Studies on Adrenal Insufficiency in Dogs: II. Blood Studies in Control Animals Not Subjected to Any Treatment, Am. J. Physiol. **78**: 711 (Nov.) 1926.

period of seventeen years. It is based on our concept that Addison's disease is the result of lack of function of the interrenal gland (adrenal cortex) and not of chromaffin tissue (adrenal medulla), since it is the cortex and not the medulla that has been proved to be the indispensable portion of the gland.[9] Accordingly, the view that the disease is due to lack of circulating epinephrine (from the medulla) and treatment aimed at supplying this deficiency by administering epinephrine is without substantial foundation.

Treatment is directed toward the correction of three principal factors: (*a*) intoxication; (*b*) metabolic disturbances, which result from lack of function of interrenalin, leading to the intoxication, and (*c*) underlying or associated conditions. The results of treatment may be expected to vary with the success attained in combating these three factors, of which the last mentioned most commonly introduces the problem of treatment of tuberculosis.

Clinically, intoxication is indicated chiefly by the gastro-intestinal disturbances, chemical changes of the blood and often by certain nervous system manifestations. These are most conspicuous during periods of acute or subacute adrenal cortical insufficiency. Our observations on the benefits obtained in experimental animals by intravenous administration of relatively large quantities of physiologic fluids[10] led me to adopt this procedure, with equal benefit, as a measure of relieving the effects of toxic accumulation in Addison's disease. I have come to consider this an indispensable aid in the management of most cases. In the presence of acute manifestations, marked improvement is usually obtained by daily intravenous injections of from 250 to 1,000 cc. of physiologic solution of sodium chloride, containing about 5 per cent of dextrose. As soon as definite improvement occurs, the frequency of injections is diminished until one or two injections are given during a week. When it is no longer necessary to keep the patient in bed, or in periods of apparent good health, it is advisable to prevent or delay the accumulation of toxic substances by a series of from six to twelve injections (once or twice weekly) at intervals of from one to three months, according to the clinical condition of the patient. This is a valuable and, indeed, necessary adjuvant to treatment of Addison's disease with adrenal extracts or so-called hormones.

Experimental and clinical evidence indicates that the symptoms in adrenal (cortical) insufficiency, or Addison's disease, are not manifestations of an immediate effect of lack of a circulating hormone. They can be better explained as the result of an accumulation of toxic products of disturbed metabolism. In the light of our experimental work, the metabolic disturbance is due to lack of function of a hormone (interrenalin), elaborated by the cortex or interrenal tissue of the adrenal. In the treatment for Addison's disease, therefore, it is aimed to correct the metabolic disturbances by administration of interrenalin in the form of extracts of adrenal cortex prepared from the glands of sheep or cattle. Interrenalin is given by mouth, except when the stomach is irritable. If the patient is troubled with nausea or vomiting, it is administered by rectal tube into the colon. The amount of interrenalin given is divided into from four to eight doses a day and corresponds to the cortical substance of one to two beef adrenals or about five to fifteen sheep glands (according to size). Comparing the results in the present series of cases with others reported in recent literature, it is evident that there is no advantage (indeed, there are disadvantages) in parenteral administration of extracts.

In most cases of Addison's disease there is progressive degeneration of the adrenals. The extent and rapidity of this process would largely determine the amount of regeneration of cortical cells that is possible. Obviously, it is necessary to continue to compensate indefinitely for loss of cortical function, by administration of products representing the cortical hormone, unless there is substantial evidence that cortical regeneration has occurred to a degree adequate to supply the minimal requirements for normal function. Administration of desiccated adrenal by mouth or injections of epinephrine have not proved of value in prolonging the life of patients with Addison's disease. Subjective improvement can often be accounted for by psychic reactions. Administration of epinephrine has often proved decidedly harmful and in one experience ephedrine caused alarming symptoms. Adrenal regeneration would be favored by prolonged rest, careful avoidance of physical and mental strain, regulation of diet and attention to proper elimination. My experience indicates that a most favorable diet includes restricted protein intake and a corresponding increase in carbohydrate foods. It may be mentioned that most patients with Addison's disease crave spicy or sour foods, such as sauerkraut and pickles, and that these articles of diet are usually well tolerated.

INTERRENALIN

I employ the name interrenalin for the hormone of the adrenal cortex, since this portion of the gland is also known as the interrenal gland tissue. A number of years ago I obtained substantial evidence that this indispensable hormone can be extracted from the adrenal cortex by various solvents, in neutral, faintly acid or faintly alkaline mediums. Aqueous, alcoholic and other volatile solvents yielded extracts, of various degrees of potency, capable of exerting a favorable influence on adrenalectomized animals. The addition of glycerin was found to increase the potency and to render the final product more stable.

Extracts, containing sufficient quantities of interrenalin to prolong life and ameliorate symptoms, by intravenous injection in completely adrenalectomized dogs, can be prepared as follows: Interrenal gland tissue is obtained by separating the cortex from the medulla of adrenals of sheep or cattle. The cortex is macerated with one or two volumes of physiologic solution of sodium chloride, to which is added a volume of glycerin equal to about one fifth of the quantity of adrenal cortex used. The mixture is agitated in a mechanical shaker for from one to two hours, or allowed to stand overnight in a refrigerator, shaken thoroughly at intervals. Ten volumes of alcohol (95 per cent) is added and the extraction continued for about twenty-four to forty-eight hours, with frequent shaking. The liquid portion is separated from the residue by decanting or straining, and the residue is again extracted with a mixture containing 10 per cent alcohol and 5 per cent glycerin in physiologic solution of sodium chloride. About two or three volumes of this

9. Stewart, G. N., and Rogoff, J. M.: Quantitative Experiments on the Liberation of Epinephrine from the Adrenals After Section of Their Nerves, with Special Reference to the Question Whether Epinephrine is Indispensable for the Organism, J. Pharmacol. & Exper. Therap. **10**: 1 (July) 1917; Further Observations Showing That Epinephrine from the Adrenals is Not Indispensable, Am. J. Physiol. **48**: 397 (May) 1919.

10. Rogoff, J. M., and Stewart, G. N.: Studies on Adrenal Insufficiency: IV. The Influence of Intravenous Injections of Ringer's Solution Upon the Survival Period of Adrenalectomized Dogs, Am. J. Physiol. **84**: 649, 1928.

mixture is used and the extraction continued for from twenty-four to forty-eight hours. After separation of the liquid from the adrenal residue, it is added to the first portion. The alcohol is then removed at low temperature, by vacuum distillation. The product is now subjected to two or three extractions with petroleum benzin or benzene. To the aqueous portion is added a sufficient quantity of physiologic solution of sodium chloride to make a final product corresponding to 1 Gm. cortex = 10 cc. extract.

The precipitation that occurs when the alcohol is added (or when alcohol is employed without first macerating the tissue with an aqueous solvent) appears to reduce the interrenalin content of the extract, probably by adsorption. I have been able to obtain potent material from the adrenal residue when the final product was lacking in power to benefit adrenalectomized dogs. It is for this reason that the second extraction has been introduced in the process described. My associates and I have employed this product and others, prepared by slight modifications of the process, since May, 1922, for intravenous administration in experimental animals. They vary some in potency in different batches made by the same process. Although we have not observed any harmful effects from repeated intravenous administration of our extracts in animals, we have considered it unwise to attempt parenteral administration in human beings until more is known about the adrenal cortical hormone, its physiologic and chemical nature, and its purification or isolation.

For oral administration of interrenalin to human beings, in cases of Addison's disease or other conditions in which it may be supposed that adrenal cortical function is impaired, I have modified the process slightly to obtain greater concentration or dosage. A larger amount of glycerin is added in the original extraction; the aqueous solvent is reduced in quantity and in the process of removal of the alcohol, and it is not aimed to remove all the alcohol. Finally, the product is completed by the addition of glycerin, instead of physiologic solution of sodium chloride, to make the desired volume. This preparation is stable for many weeks if kept in a cool, dark place and in well stoppered containers. One should determine the potency of this product, however, on completely adrenalectomized dogs before relying on it as a therapeutic agent.

COMMENT

In this communication I have described the management of Addison's disease and its treatment with adrenal cortical extract which represents the indispensable hormone (interrenalin) of the gland. The treatment is a direct development of experimental work conducted in this laboratory and is based on the newer concept of the relation of the adrenals to the disease. Our researches have demonstrated that interference with the supply or function of interrenalin, from the cortex, and not epinephrine, from the medulla, is responsible for development of the syndrome.

More than fifteen years ago, Stewart and I[9] demonstrated that epinephrine (adrenalin) secretion from the adrenals is not indispensable for life and good health of animals and that the fatal outcome of adrenalectomy is due to loss of function of the cortex or interrenal gland substance, not of the medulla or chromaffin substance. Our interest was then concentrated chiefly on studies on the cortex, which have continued up to the present and are still in progress. These studies in animals have yielded certain data of considerable clinical value. In a large series of adrenalectomized animals, which serve as controls for our studies on the influence of various procedures on adrenal insufficiency, information was obtained concerning the clinical course, blood changes, survival period and the like.[11] We obtained the first substantial evidence that the adrenal cortex supplies an indispensable hormone, which is obtainable by extraction and is capable of prolonging life and ameliorating symptoms in adrenalectomized animals,[5] and in Addison's disease.[2]

The clinical picture of adrenal insufficiency in these animals is quite comparable with that seen in the acute crises of Addison's disease. Recently, subacute and chronic manifestations and pathologic lesions in the adrenal glands, comparable or identical with those occurring in Addison's disease, have been successfully created in experimental animals.[7] In both human cases and experimental animals the blood shows the same changes. There is an increase in the total nonprotein nitrogen, in urea nitrogen and particularly in the "undetermined fraction" of the nonprotein nitrogen. Blood sugar is usually only moderately diminished, calcium is frequently increased and the relative volume of corpuscles to plasma is increased. In animals there is no significant reduction in blood pressure until the acute phenomena develop. The period of good health, following total loss of the adrenal glands, ranges from one to two weeks. During this period there is no indication that the loss of the glands has affected the blood pressure.[12]

All the available evidence, from our experimental and clinical studies, supports the concept that the symptoms seen in Addison's disease and in adrenalectomized animals constitute manifestations of metabolic disturbances that lead to a severe intoxication. We observed not only that these disturbances can be relieved by administering adrenal cortical extracts but also that amelioration of symptoms and prolongation of life can be effected, in adrenalectomized animals, by intravenous administration of physiologic solution of sodium chloride.[10] Of course, this does not supply a missing hormone, and its beneficial influence can be explained only on the basis of dilution of toxic material and facilitation of its elimination. Thus, it becomes an indispensable adjuvant in the treatment of Addison's disease with extracts representing the hormone of the adrenal cortex.

A number of articles by other writers have appeared in recent literature on treatment of Addison's disease by parenteral administration of adrenal extracts. Some of them appear to confirm the results observed by me but, unfortunately, none of them include a series of satisfactory cases of Addison's disease that have been observed, under treatment with extracts, sufficiently long to afford convincing evidence. Indeed, there is no indication that in any of the cases was life prolonged beyond the maximum duration of untreated patients. No such periods of survival as occur in table 1 of this article have thus far been shown. It is remarkable that oral administration of an adrenal cortical extract should prove more valuable, in compensating for lack of the cortical hormone, than parenteral administration, the more so since the extracts used by others are prepared by a process similar to that originally employed and

11. Rogoff and Stewart (footnotes 8 and 10); Studies on Adrenal Insufficiency in Dogs: I. Control Animals not Subjected to Any Treatment, Am. J. Physiol. **78**: 683 (Nov.) 1926.

12. Rogoff, J. M., and Dominguez, R.: Blood Pressure Following Adrenalectomy, Am. J. Physiol. **83**: 84 (Dec.) 1927.

described by us, or slightly modified, the chief difference being a greater dosage or concentration, resulting from the use of much larger amounts of adrenal gland per unit quantity of final product.

While spectacular resuscitation from coma and other phenomena of acute addisonian crises is often accomplished by intravenous administration of saline solution, the effects of oral administration of interrenalin, following the saline solution, are more lasting. Spontaneous recovery from an acute crisis is not uncommon in this disease, sometimes occurring after coma has developed. This was observed quite recently, in case 3 of table 1, the patient temporarily recovering spontaneously after having been in coma for seven hours. Similar experiences have been witnessed among our experimental animals. Such a recovery can mistakenly be attributed to treatment and may lead to overconfidence in the remedy. Duration of life, therefore, rather than temporary amelioration of symptoms, is much more reliable as a criterion for the value of an extract in treatment of Addison's disease.

It has been mentioned that, under various forms of treatment other than with interrenalin, no such increases in the duration of survival have been observed in cases of unmistakable Addison's disease as are shown in table 1. Dr. Snell [13] of the Mayo Clinic, referring to interrenalin, says: "At the clinic recently, observations have been made of a patient under treatment with this extract, who appears to have obtained definite benefit. It is only fair to say that none of the patients treated with interrenin have lived longer or have remained in better condition than certain patients who have been treated by the familiar Muirhead regimen." As this statement was made in 1929, Dr. Snell was not then in as good a position to judge the relative merits of these two methods of treatment as now. It may be stated that a number of the cases reported in table 1 of this paper that had been decidedly benefited by interrenalin had previously been unsuccessfully treated by the Muirhead regimen. The only patient who received interrenalin who had been under previous treatment by the Muirhead regimen at the Mayo Clinic was a man from Toronto, Ont., referred to me by Dr. Snell for treatment. This patient is included as case 6 in table 1. He survived five years from the onset of the disease, or three and one-half years from the beginning of treatment with interrenalin. Although unable to do any kind of work for about eighteen months and not materially benefited by other treatment, he resumed his business, as a retail merchant, after about six months of treatment with interrenalin and continued a reasonably active existence for three years thereafter.

CONCLUSIONS

1. The comparison of cases treated with interrenalin and those under other treatment demonstrated decided prolongation of life and amelioration of symptoms in the former. Permanent relief or cure of the syndrome, however, can rarely, if ever, be accomplished.

2. Addison's disease is the result of lack of function of the adrenal cortex (interrenalin) and not of the medulla (epinephrine). Treatment with epinephrine, therefore, is based on a concept that is not supported by substantial physiologic evidence.

3. Further knowledge, leading to earlier recognition of the disease, is essential.

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13. Snell, A. M.: Some Recent Advances in Endocrinology, Coll. Papers, Mayo Clinic **21**: 466, 1929.

A TISSUE SUBSTRATE MICROCULTURE FOR TUBERCLE BACILLI

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The discovery of scientific facts of practical significance has not always led to their immediate practical extensive application but has awaited some simple modification of methods which could be quickly and easily performed by the majority of practitioners. The clinician has been aware of the limited value of the microscopic examination of the stained smear for acid-fast bacilli, and yet the simplicity and speed of this method has almost restricted the examination for tubercle bacilli to its use by the physician. He has had to be content with this because guinea-pigs and culture mediums required facilities which were hardly justified for his daily routine. The fact that he usually obtained a single specimen, and that especially only in the advanced case could he be certain to find acid-fast bacilli by this method, could hardly concern him. He was aware that this method [1] required as many as 100,000 acid-fast bacilli per cubic centimeter to be seen in the microscope while the guinea-pig and culture methods would disclose as few as from 10 to 100 tubercle bacilli.

A recent study [2] of single specimens of sputums, negative on microscopic examination of the stained smear for acid-fast bacilli, disclosed 51 per cent of these positive for tubercle bacilli when tested by a single culture method. In all previously recommended culture methods for tubercle bacilli a specially prepared sterile culture medium (potato or egg) was required for the test. There have been several attempts to concentrate and grow tubercle bacilli directly in sputum and tuberculous materials for diagnostic purposes, but none has met with success. The more recent of these is that proposed by Schiller in 1925 and in 1928.[3] Schiller added an equal volume of 75 per cent glycerin and an amount of dextrose not to exceed 5 per cent to the sputums and thought he observed the growth of tubercle bacilli within a few days at 37 C., an obviously erroneous observation considering the rate of multiplication of tubercle bacilli. He also thought that the bacilli multiplied without the addition of glycerin and that after forty-eight hours they began to disintegrate. He was unaware of the fact that 37.5 per cent glycerin would prevent growth of the bacilli (which he discovered later) and that fermentation of the dextrose would cause a high acidity sufficient to destroy the bacilli and that putrefaction which was not prevented by the glycerin was also detrimental to the growth of the tubercle bacilli, not to mention the poor nutrient qualities of the sputum itself.

For the purpose of obtaining a growth from small numbers of tubercle bacilli there are two requirements that must be fulfilled: one is that the medium for

From the Research Department, National Jewish Hospital.
Dr. Arthur P. Damerow, Walter Lawrenz and Stuart Germain assisted in the experiments on which this report is based.
Read before the Section on Pathology and Physiology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 13, 1932.

1. Corper, H. J.: The Certified Diagnosis of Tuberculosis: Practical Evaluation of a New Method for Cultivating Tubercle Bacilli for Diagnostic Purposes, J. A. M. A. **91**: 371 (Aug. 11) 1928.
2. Corper, H. J., and Cohn, M. L.: A Routine Clinical Examination for Tubercle Bacilli in Microscopic Negative Sputums by Various Culture Methods, to be published.
3. Schiller, I.: Vorversuche zur Züchtung der Tuberkelbazillen und säurefesten Saprophyten im Auswurfe, Centralbl. f. Bakt. (Abt. 1) **96**: 92, 1925; Ueber "erzwungene" Antagonisten, ibid. **96**: 54, 1925; Zur Frage der Züchtung der Tuberkelbazillen im negativen Auswurfe, ibid. **108**: 1 (July 25) 1928.

growth is sterile, and the second that the medium is a good nutrient for promoting growth in the presence of few tubercle bacilli.

These are essential aside from appropriate incubator temperature (about 37 C.) and isotonic and neutral (about p_H 7) conditions of the nutrient medium, which must be maintained throughout the period required for the multiplication of the bacilli.

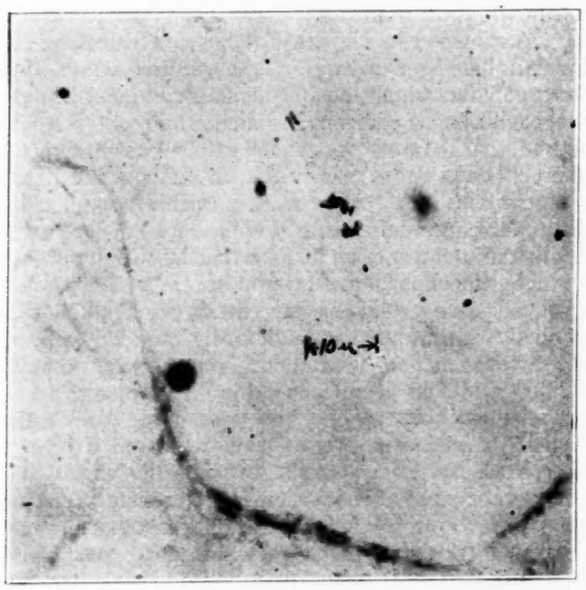

Fig. 1.—Oil immersion magnification showing the nature of the bacilli in the control suspensions.

After learning that the appropriate use of acid was not only serviceable in destroying undesirable contaminators and saprophytic acid-fast bacilli in tuberculous materials,[4] but that a relatively low p_H would also destroy the viability and finally the morphologic integrity of the tubercle bacillus at incubator temperature,[5] it was determined to apply this knowledge and that concerning nutrients for the tubercle bacilli to the development of a simple culture method for discerning their presence in small numbers. It had earlier been learned [6] that the addition of protein split products and broth as well as agar were not essential for the growth of tubercle bacilli in the presence of potato or egg yolk, although glycerin was required by the glycerophilic strains of bovine bacilli, and especially for human tubercle bacilli.

Since from an equal to 2 volumes of 6 per cent sulphuric acid or 5 per cent oxalic acid at 37 C. for from thirty minutes to one hour was capable of destroying undesirable contaminators in tuberculous material without being detrimental to the contained tubercle bacilli, according to our earlier studies, and since neutralization with an isotonic agent and preferably one of definite buffer value without detrimental toxic action to tubercle bacilli was required, a number of preliminary tests were performed with small numbers (graded fine suspensions) of tubercle bacilli and with a variety of nutrients. Since it seemed advisable also to keep the number of actual operations down to a minimum, elaborate or repeated washings should be obviated if possible. Among the numerous neutralizing solutions tested were included sodium hydroxide, disodium phosphate (1.89 per cent anhydrous) and sodium bicarbonate (1.3 per cent).

Among the numerous nutrients studied were sputums, whole blood from man and various animals, the serum or plasma and corpuscle fractions, liver from the chicken, rat, guinea-pig, rabbit and dog, spleen from the dog, whole egg, both yolk or white, potato, both raw and cooked, and yeast. As test organisms were used, fine suspensions were prepared from a number of recently isolated strains of tubercle bacilli as well as an old virulent human laboratory strain previously described as "Gluckson." All tests with the neutralizing agents were performed both electrometrically and with indicators throughout the course of the tests, including up to three months or longer, at incubator (37 C.) temperature. Washing with 0.9 per cent sodium chloride solution was found of little value in attempting to remove the acid from tissues such as blood, liver, and spleen. Without going into the details of the experiments, it was found that a 1.3 per cent (isotonic) solution of sodium bicarbonate was better suited to attaining and maintaining a neutral (p_H 7) and buffered condition of sputums or tissues previously treated with sulphuric or oxalic acid than either sodium hydroxide or disodium phosphate, although sodium hydroxide could be used, but the danger of passing the neutral point was far greater than with sodium bicarbonate. Sodium bicarbonate possessed the disadvantage of energetic effervescence during the addition of the first fifth of the solution required for neutralization, but if this was added cautiously at first with shaking the effervescence proved of little annoyance.

Fig. 2.—High power magnification showing young acid-fast skein after the bacilli have grown for one week on the blood substrate.

Tests comparing oxalic acid with sulphuric acid proved the former unsuitable when only neutralized with an isotonic solution, since sufficient oxalate was retained in the mixture and tissues to inhibit the growth of small numbers of tubercle bacilli. Sulphuric acid (chemically pure) was therefore chosen, since its salts

4. Corper, H. J., and Uyei, Nao: The Cultivation of Tubercle Bacilli: An Improved Method for Isolation from Tuberculous Materials, J. Lab. & Clin. Med. **13**: 469 (Feb.) 1928; Further Observations With a New Method for Cultivating Tubercle Bacilli: A Comparison With Guinea-Pig Inoculation and Petroff's Method, ibid. **14**: 393 (Feb.) 1929; Oxalic Acid as a Reagent for Isolating Tubercle Bacilli and a Study of the Growth of Acid-Fast Non-Pathogens on Different Mediums with Their Reaction to Chemical Reagents, ibid. **15**: 348 (Jan.) 1930.

5. Corper, H. J.: The Lysis of Tubercle Bacilli, to be published.

6. Corper, H. J., and Uyei, Nao: A Simple Glycerol Water Crystal Violet Potato Cylinder Medium for Diagnostic Cultures of Tubercle Bacilli, Arch. Path. **7**: 835 (May) 1929.

in the amount retained in the final solution and tissues possessed no toxicity for the tubercle bacilli. Hydrochloric acid (3 per cent) solution can also be used, but the volatile nature of this acid and the possibility of change when kept over long periods of time made us prefer the sulphuric acid, which can be kept in a glass stoppered receptacle for years without deterioration.

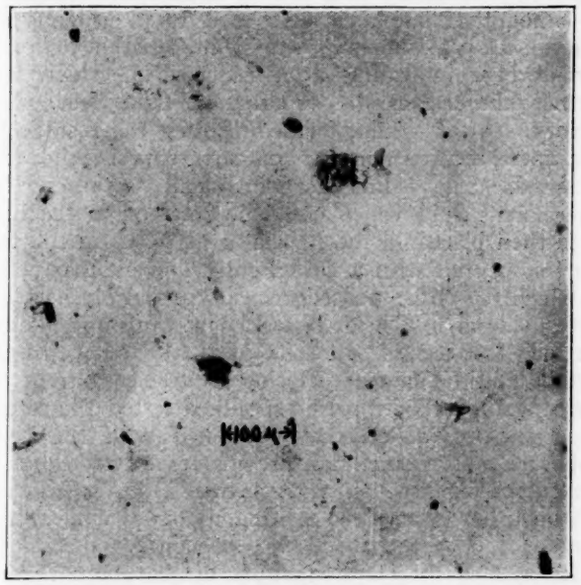

Fig. 3.—Low power magnification of figure 4.

In order first to determine what fractions of human and dog blood were good nutrients for tubercle bacilli, both inspissated whole blood, serum or citrated plasma, and cells, as well as the same fractions treated with sulphuric acid and neutralized with isotonic sodium bicarbonate, were tested. It was found that the serum or plasma fractions were relatively poor mediums as compared to the cellular elements. The neutralized sulphuric acid material, however, yielded little residue with serum and plasma and might not have given convincing evidence without the tests with the inspissated material.[7] The same findings were obtained with egg white and egg yolk, the latter proving to be a good nutrient as compared to the white.

In order to determine the nutrient value of the tissue substrate (residue) of human blood (and dog blood) after treatment with sulphuric acid and neutralization with sodium bicarbonate, the material thus obtained was planted with varying amounts of fine suspensions of recently isolated human tubercle bacilli (from sputum) and a laboratory strain of virulent human tubercle bacilli, and growth of the bacilli was obtained in a planting of 0.000,000,01 mg. within four weeks. The criterion for growth was the finding of skeins of acid-fast bacilli in stained smears by microscopic examination, shown in the illustrations. These bacilli produced generalized tuberculosis when inoculated into guinea-pigs and fulfilled all the other requirements for tubercle bacilli as contrasted to saprophytic acid-fast bacilli. In order further to determine whether this nutrient in neutral sodium bicarbonate (containing 3 per cent glycerin) solution would suffer deterioration, so far as being able to support the growth of tubercle bacilli, the neutral substrate (residue) was placed in the incubator in sterile bacteriologic test tubes stoppered with (sterile) corks previously dipped in paraffin to prevent evaporation and still allowing sufficient access of atmospheric air, and after from four to eight weeks' residence in the incubator at 37 C. it was planted with graded amounts of fine suspensions of tubercle bacilli. Electrometric readings of the p_H of ten blood specimens treated with sulphuric acid and neutralized with 1.3 per cent sodium bicarbonate containing 3 per cent glycerin showed practically no change as a result of incubation and ranged from p_H 6.74 to p_H 7.6. The results obtained with two such human blood substrates are recorded in table 1.

7. The complete data on this will appear shortly in conjunction with other studies on the blood in tuberculosis.

TABLE 1.—*Growth of Tubercle Bacilli on Sulphuric Acid-Treated, Sodium Bicarbonate-Neutralized Human Blood Substrate (Residue) Incubated Four Weeks Prior to Planting*

	Strain of Tubercle Bacilli and Amount Planted in Milligram*					
	"Gluckson" a Virulent Human Laboratory Strain		Recently Isolated Human Sputum Strains			
			No. 6		No. 7	
Human Blood Used	0.000,01	0.000,000,1	0.000,01	0.000,000,1	0.000,01	0.000,000,1
A	4†	6	3	4	4	6
B	2	4	2	4	3	4

* In the table only the 0.000,01 and 0.000,000,1 mg. per cubic centimeter plantings are recorded, since all the heavier plantings were positive and only the sparse seedings are significant in revealing the nutrient qualities of the medium for few bacilli.

† The numeral given in the table indicates the number of weeks of incubation after planting at which positive findings were first obtained, stained smears being examined at weekly intervals.

It is evident from the results recorded in table 1 that the sulphuric acid-treated sodium bicarbonate-neutralized human blood residue, even after incubation at 37 C. for from four to eight weeks, does not lose its property of supporting the growth of small numbers of tubercle bacilli.

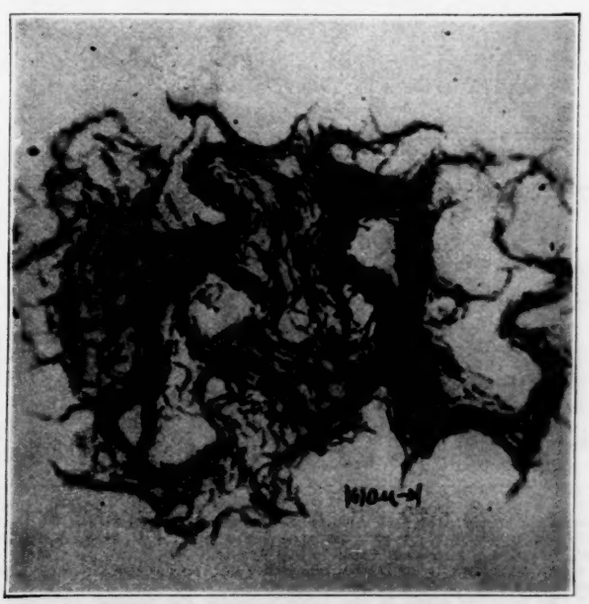

Fig. 4.—Oil immersion magnification showing another type of acid-fast skeins after two weeks' growth on blood substrate.

That animal tissues (liver and spleen) as well as whole egg, egg yolk and, under certain circumstances, cooked potato possess this same property of being a good nutrient for small numbers of tubercle bacilli, is evident from the findings recorded in table 2.

When it had been thus determined that the sulphuric acid-treated, sodium bicarbonate-neutralized tissue substrates were good nutrient mediums for small numbers of tubercle bacilli, it was deemed advisable to apply this information to the study of contaminated tuberculous materials, and for this purpose a hundred sputums, found negative for acid-fast bacilli by careful microscopic examination of stained smears, were chosen. The

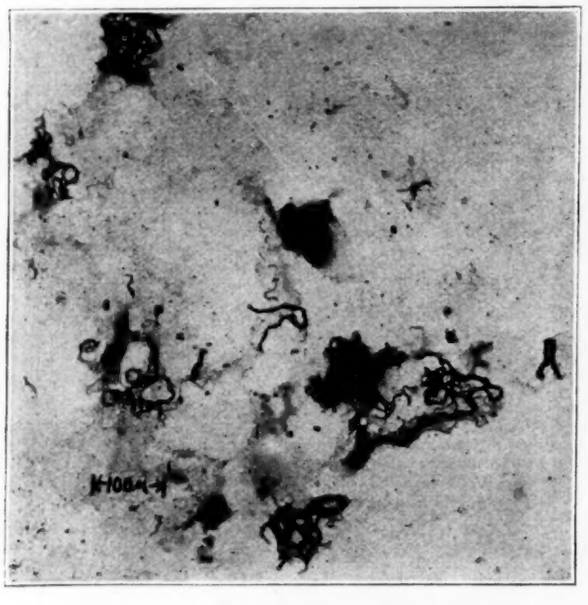

Fig. 5.—Low power magnification of figure 6.

specimen was homogenized, by means of an electric agitator, to obtain samples as uniform as possible. Three 1 cc. specimens were taken and one was used as such; to the second was added a few drops (0.25 to 0.5 cc.) of sterile citrated human blood and to the third about 0.5 cc. of fresh egg yolk (aseptically obtained from fresh eggs). (As a control, the sputum was tested by means of the oxalic acid-crystal violet potato medium method previously described).

TABLE 2.—*Nutrient Properties of Various Tissue Substrates for Small Numbers of Tubercle Bacilli as Compared to Long's Synthetic Medium*

Strain of Tubercle Bacilli	Amount of Planting, Mg. per Cc.	Tissues Tested: Liver of Chicken	Liver of Rat	Liver of Guinea-Pig	Liver of Dog	Dog's Spleen	Potato (Cooked)*	Whole Egg	Egg Yolk†	Long's Medium§
"Gluckson," a virulent human strain	0.1	2‡	2	2	2	2	2	2	2	8
	0.001	2	3	2	2	2	2	2	2	0
	0.000,01	3	2	2	2	2	4	3	2	0
	0.000,000,1	3	3	3	3	2	4	3	3	0
"A," a recently isolated human sputum strain	0.1	2	2	2	2	2	2	2	2	4
	0.001	2	4	3	2	2	3	2	2	0
	0.000,01	3	2	3	3	3	3	3	3	0
	0.000,000,1	4	3	4	4	4	4	4	4	0

* Raw potato finely pulverized was tested also, but on incubation it became decidedly acid and unsuitable for the growth of tubercle bacilli, while both cooked and raw potato was found less satisfactory than tissues or egg for making satisfactory smears.

† Egg white was also tested, but proved to be a poor nutrient; therefore it was not included in the table.

‡ The numeral given in the table indicates the number of weeks of incubation after planting at which positive smears microscopically were first obtained.

§ Long's medium (Long, E. R.: Tubercle **6**: 128 [Dec.] 1924) was used as a control. This was obviously not submitted to sulphuric acid treatment and neutralization but was used in its original form.

Each of the test tubes was treated with from 1.5 to 2 cc. of 6 per cent sulphuric acid solution, and after being mixed well the tubes and contents were kept at 37 C. for about forty-five minutes. To the specimen was then added, in small portions at first to avoid disastrous effervescence, an amount of 1.3 per cent sodium bicarbonate solution containing 3 per cent pure glycerin, which in preliminary tests proved sufficient to neutralize the amount of sulphuric acid used for sterilizing the sputum. A pale blue or greenish blue reaction to bromthymol blue indicating a p_H 6.8 to 7.4, which was further checked in the supernatant fluid, was satisfactory. After settling or sedimenting the residue by low speed centrifugation, the supernatant fluid was decanted. The sediment and a small portion of the supernatant fluid which could be retained in the tube were then placed in the incubator at 37 C. in the test tube, stoppered with a cork lightly dipped in paraffin, in which the entire procedure was carried out; smears were made at weekly or biweekly intervals and stained for acid-fast bacilli. In spite of the simplicity of the method and the danger of losing the test because of the use of a single tube for each specimen tested, the results closely approximated those obtained with the more elaborate culture methods previously proved equal to the guinea-pig test. In no case was a positive finding obtained, however, when sputum was used alone. The results of this experiment are summarized in table 3.

In view of the empiric nature of the sputum specimens tested, which is based on the lack of uniformity in routine tuberculous materials, combined with the excellent nutrient qualities for small numbers of tubercle bacilli of both blood and egg yolk in control experiments, it appears that the method of tissue substrate

Fig. 6.—High power magnification showing numerous dense acid-fast skeins after four weeks' growth on blood substrate.

microculture for determining the presence of tubercle bacilli, particularly because of its simplicity, should find a place for the ready determination of tubercle bacilli in tuberculous materials.

The method consists of placing from 0.5 to 1 cc. of well ground-up or finely divided suspected specimen (sputum, tissue, etc.) in a sterile bacteriologic test tube, 6 by 5/8 inch, or 6 by 3/4 inch, stoppered with a cork, after sterilization by dipping the end to be inserted into

the tube into hot sterile paraffin. To the suspected specimen is added a few drops (0.5 cc.) of sterile citrated (1/10 volume of sterile 3 per cent neutral trisodium citrate) human blood (other bloods if available will also do) or 0.5 cc. of fresh egg yolk. Blood appears more suited than egg yolk, primarily because of the more scattered skein colonies growing in the blood, although egg yolk has proved satisfactory as a

Fig. 7.—Low power magnification of figure 8.

nutrient in control tests. To the well mixed specimen and nutrient is added about from 1½ to 2 volumes of 6 per cent sulphuric acid which is intimately mixed by shaking, and the acid preparation is then placed in the incubator at 37 C. for about forty-five minutes (a range of from one-half to one hour is admissible), being vigorously shaken occasionally during incubation. After removal from the incubator, the acid is neutralized by the cautious addition of a volume of sterile 1.3 per cent pure sodium bicarbonate solution containing 3 per cent pure glycerin previously determined adequate to neutralize the amount of 6 per cent sulphuric acid used. Bromthymol blue, 0.04 per cent, was used as indicator and a deep green blue (p_H 6.8) or light blue (p_H 7.4) color was found to be satisfactory,[8] following Clark's description and technic of making the tests. Neutralization can also be performed with sodium hydroxide, although the danger of passing the neutral zone is greater and it does not act as efficiently as sodium bicarbonate as a buffer during incubation. After neutralization, the tissue substrate is allowed to settle overnight in the refrigerator or the mixture can be centrifugated at low speed, after which the supernatant liquid is decanted, leaving a small portion behind (from 0.5 to 1 cc. above the sediment) to serve in readily shaking and making smears when required; a 2 to 3 cc. total volume of tissue substrate and liquid suffices when the original specimen including nutrient was from 1 to 1.5 cc. in amount. After shaking to break up the sediment, the tube is carefully stoppered and is placed in a dark incubator at 37 C. After shaking the tubes well on removal from the incubator, smears are made at weekly or biweekly intervals on clean slides covered with a thin film of Mayer's albumin fixative, and after carefully fixing by heat, they are stained with steaming carbol fuchsin according to the Ziehl-Neelsen technic for acid-fast bacilli, precautions being taken not to wash off the smear during staining and decolorizing.

8. Clark, W. M.: The Determination of Hydrogen Ions, Baltimore, Williams & Wilkins, 1920. Most texts on clinical diagnosis and physiologic chemistry outline the technic of determining the p_H colorimetrically.

TABLE 3.—*Growth of Tubercle Bacilli, Contained in One Hundred Sputums Negative by Microscopic Smear Examination, After Sulphuric Acid Treatment Following the Addition of Blood or Egg Yolk as Nutrients, and Neutralization With 1.3 Per Cent Na_2HCO_3 With 3 Per Cent Glycerin*

Method Used		New Positive Culture Sputum Findings at Weekly Readings				Total Positives
		2 Wks.	3 Wks.	6 Wks.	12 Wks.	
Tissue substrate from H_2SO_4 treatment	Sputum alone	0	0	0	0	0
	Sputum + blood	1	21	17	4	53*
	Sputum + yolk	0	19	15	4	
Oxalic acid + potato medium		1	7	36	7	51
Oxalic acid + yolk medium		3	19	21	4	47

* By the tissue substrate method there were fifteen positive sputums in the tests where blood was added as nutrient but in which the egg yolk nutrient test was negative, and there were ten egg yolk sputum tests positive with the blood nutrient test negative. In view of the fact that only a single tube was included for each sputum with the blood and egg yolk substrate tests, and that in addition the empiric nature of tuberculous specimens would vary widely even in using duplicate tubes, it was felt that the total figure given might better represent the actual practical value of this test, and especially in view of the fact that the more significant control tests proved the blood substrate and egg yolk substrate to be an excellent nutrient for small numbers of tubercle bacilli.

The bacilli when found usually occur in skeins and lumps and are readily recognized. The use of the sulphuric acid as described destroys saprophytic acid-fast bacilli and contaminators, so that positive findings indicate the presence of tubercle bacilli except in rare

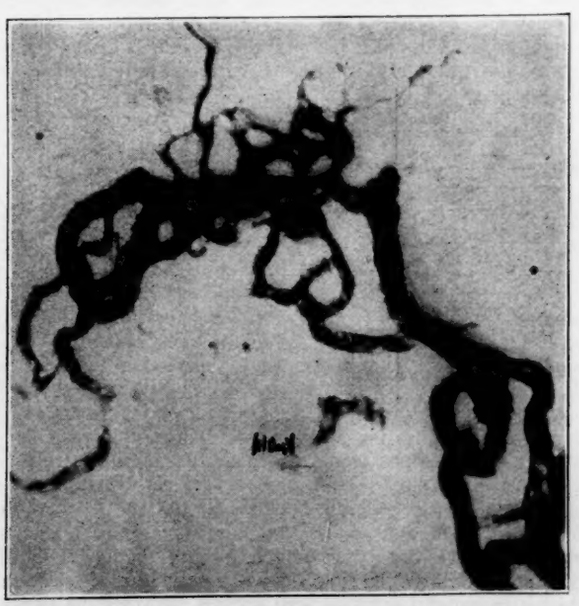

Fig. 8.—High power magnification showing another type of acid-fast skeins after three weeks' growth on egg yolk substrate.

cases. In our extensive experiences with the sulphuric and oxalic acid methods we have found saprophytic acid-fast bacilli only twice in thousands of specimens tested. When found they can easily be differentiated by their rapidity of growth on the ordinary poor nutrient mediums and by their ability to grow at room temperature.

SUMMARY

A simple culture method is described for growing small numbers of tubercle bacilli from suspected specimens that are negative on microscopic examination of smears.

The method designated the "tissue substrate micromethod for culturing tubercle bacilli" is based on the fact that from 1 to 2 volumes of 6 per cent sulphuric acid will destroy undesirable contaminators and saprophytic acid-fast bacilli within from one-half to one hour at 37 C., and that blood or egg yolk, after the sulphuric acid treatment, neutralized with an isotonic solution (1.3 per cent) of sodium bicarbonate containing 3 per cent glycerin, is a good nutrient medium for supporting the growth of small numbers of human tubercle bacilli at 37 C. In control laboratory tests and in routine empiric tests with sputums negative on microscopic examinations of smears, the simple tissue substrate microculture has revealed a high percentage of positive findings for tubercle bacilli, which recommends the test for this purpose in practice.

ABSTRACT OF DISCUSSION

DR. JOSEPH E. POTTENGER, Monrovia, Calif.: Dr. Corper's recommendation of liquid mediums instead of the solid mediums for the growth of tubercle bacilli seems preferable in respect to the ease with which better distribution of the organisms may be attained. The mechanical shaker might add appreciably to the efficiency. It is a little early to tell just how valuable culture work will be to the clinician. Undoubtedly it will clear up some diagnoses. Various workers in this line have spoken of the more absolute result to be obtained from culture than from guinea-pig inoculation. This statement is made with the knowledge that the guinea-pig sometimes contracts tuberculosis spontaneously. In another sense, however, no method can be considered absolute, at least from an academic point of view. I refer to the possibility of the contamination of materials collected under open conditions. During fifteen years' experience in the search for tubercle bacilli in sputum prepared by the dilution-flotation method I have required the demonstration of rare bacilli on three different occasions before a diagnosis is made. I suggest that the results from the culture method be accepted with the same reservation.

DR. HARRY J. COOPER, Denver: It is evident that a positive specimen gaged from the microscopic examination of the stained smear or section is worthless for determining the value of the culture or any test for discerning few bacilli, while a negative specimen by smear examination may mean little as to its actual content in bacilli. Lack of consideration of this and purely technical errors also account for the discrepancy in the observations of different investigators when the results of the culture method are compared with those obtained with the guinea-pig test. The tissue substrate method should find easy adaptability for the practitioner whose object is to find few bacilli if they are present. To say it would replace for all purposes the guinea-pig or the potato or the inspissated egg yolk medium methods would not conform to all considerations in the case, although these methods are all equally sensitive for discerning few tubercle bacilli. In the use of all culture methods it becomes essential that contaminators are efficiently destroyed, since they prevent the growth of tubercle bacilli. This applies particularly to the tissue substrate method, in which the material must be well broken up, since the sulphuric acid is able to penetrate completely only rather small particles of tissue and débris. It is essential to conform to the technic of acid sterilization outlined for another reason, and that is that unless this is done saprophytic acid-fast bacilli may survive and lead to erroneous observations, which can then be differentiated only by further culture tests. The sulphuric acid treatment as I have outlined it has been devised to obviate this error. If material is heavily contaminated, a larger amount of acid and longer incubation with the acid must be resorted to in order to assure destroying these undesirable microorganisms. The lack of uniformity of empirical tuberculous material also makes advisable repetition of tests when the observations are negative, regardless of the method used; and here the simple tissue substrate method possesses advantages. It was surprising that in spite of the greater possibility of contaminations with the tissue substrate method the efficiency in empirical tests proved highly gratifying and equal to the other methods for discerning few tubercle bacilli. All that is required for performing the test, besides the few simple reagents and a microscope, is an incubator. I feel that in the practice of medicine the tissue substrate microculture for tubercle bacilli will fill a place as a simple, delicate, diagnostic procedure which can be used by any physician who has a small incubator at his disposal and can stain smears for tubercle bacilli. The addition of two volumes of 6 per cent sulphuric acid to a freshly obtained and finely divided suspected human specimen kept at 37 C. for a period up to one hour and shaken occasionally during this time destroyed the contaminators and saprophytic acid fast bacilli in more than 99 per cent of suspected tuberculous materials examined within the past five years.

TRANSPLANTATION OF URETERS INTO LARGE INTESTINE BY SUBMUCOUS IMPLANTATION

CLINICAL APPLICATION OF TECHNIC 3

ROBERT C. COFFEY, M.D.

PORTLAND, ORE.

During the course of twenty-four years' study of this subject, three types or principles of technic have been introduced and numbered in the chronological order of their development: [1]

Technic 1 (fig. 1 *A*).—The ureter is drawn into the interlamellar space immediately beneath the intestinal mucosa, and its split end is dragged through an opening made in the mucosa at the caudal end of an uncompleted intestinal incision and anchored inside the intestine, thereby bringing the open ureter into the intestinal lumen at the time of operation.

Technic 2 (fig. 1 *B*).—A tube or catheter is fastened within the ureter by ligatures which both seal the ureter against intestinal infection and anchor it to the catheter, after which the catheter is passed through an opening made in the mucosa at the caudal end of an uncompleted intestinal incision and is used to draw the ureter into the interlamellar space beneath the intestinal mucosa and through the opening in the mucosa into the intestinal lumen. The urine is transmitted from the upper ureter through the catheter into a receptacle outside the body. The anastomosis is completed, and the open ureter is exposed to intra-intestinal pressure only after the intra-intestinal end of the ureter sloughs and permits the

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Owing to lack of space, this article is abbreviated here by the omission of two illustrations. The complete article appears in the author's reprints.

1. The chronological development of the three technics may be followed by referring to the following articles by the author:

(*a*) Pancreato-Enterostomy and Pancreatectomy, Ann. Surg. **50**: 1238 (Dec.) 1909.

(*b*) Physiologic Implantation of the Severed Ureter or Common Bile Duct into the Intestine, J. A. M. A. **56**: 397 (Feb. 11) 1911.

(*c*) A Technic for Simultaneous Implantation of the Right and Left Ureters into the Pelvic Colon Which Does Not Obstruct the Ureters or Disturb Kidney Function, Northwest Med. **24**: 211 (May) 1925.

(*d*) Completed Aseptic Technic for the Implantation of the Ureter into the Large Bowel, Surg., Gynec. & Obst. **45**: 816 (Dec.) 1927.

(*e*) Transplantation of the Ureters into the Large Intestine, ibid. **47**: 593 (Nov.) 1928.

(*f*) Experimental Transplantation of Ureter in Which a Transfixion Suture is Used to Complete the Anastomosis, Northwest Med. **29**: 128 (March) 1930.

(*g*) Production of Aseptic Uretero-Enterostomy, J. A. M. A. **94**: 1748 (May 31) 1930.

(*h*) Transplantation of the Ureters for Cancer of the Bladder with Cystectomy, Ann. Surg. **91**: 908 (June) 1930.

(*i*) Transplantation of the Ureters into the Large Intestine: Submucous Implantation Method, Brit. J. Urol. **3**: 353 (Dec.) 1931.

catheter to come away from eight to sixteen days after operation.

Technic 3 (fig. 1 *C*).—The ureter is brought into the interlamellar space outside the intestinal mucosa by an anchor stitch which fastens the end of the ureter in the

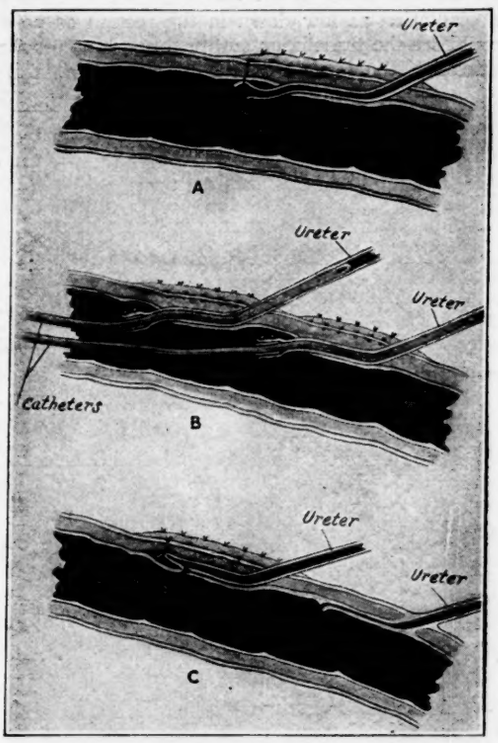

Fig. 1.—Three plans of technic for transplantation of the ureters by the submucous implantation method: *A*, technic 1, described in articles a and b, footnote 1; *B*, technic 2, described in articles c and e; *C*, technic 3, described in articles f, g and h.

up to the present time. It has furnished the foundation of the entire structure of ureteral transplantation by clinically demonstrating that a valve formed by submucous implantation of the ureter amply protects the kidney against intra-intestinal pressure and infection. Its use has been largely limited to cases of exstrophy of the bladder. In this connection, the clinical work of C. H. Mayo, Walters, Cabot and their associates in the Mayo Clinic has been outstanding.

In technic 2, the flow of urine is not disturbed. Bilateral transplantation is therefore feasible. This technic is unquestionably the method of choice in cases of cancer of the bladder and in incurable tuberculosis of the bladder in which one kidney has been removed previously. As compared with technic 1, it is to be preferred in all cases in which the ureters will admit number 10 catheters without producing ischemia. The members of the Mayo Clinic are inclined to use technic 1 for all cases of exstrophy of the bladder in children regardless of the size of the ureters.

Technic 2 has greatly extended the field of ureteral transplantation. Its most notable achievement has been in opening up the field of cancer of the bladder for radical surgery. The prognosis after radical treatment of cancer of the bladder is relatively good. In my experience with eight cases in which the patients have recovered from operation, one patient died five months later, without the presence of a physician, and the cause of death was undetermined. There was no evidence of recurrence of the growth in his postoperative history. Of the eight patients, seven are living, well and happy, four years, three years, two years seven months, two years three months, two years two months, one year three months, and ten months, respectively, after operation. All have been examined recently. There is no evidence of recurrence in any case.

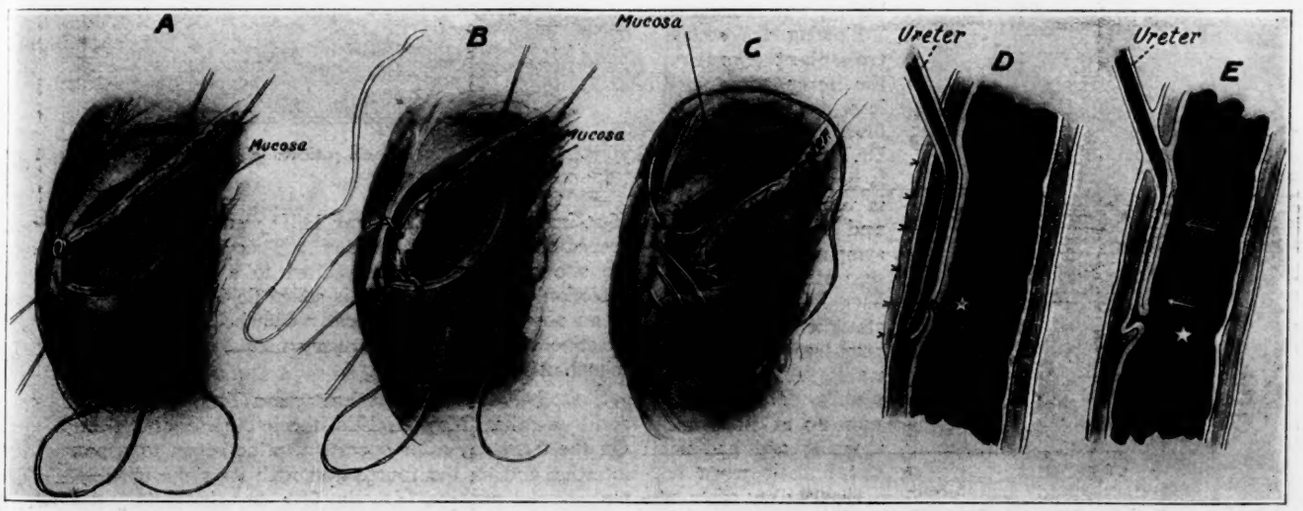

Fig. 2.—Transfixion suture technic for making ureto-enteric anastomosis: *A*, end of ureter has been transfixed and ligated with oo chromic catgut suture, doubled, and *B* is anchored in the angle of the wound between the mucosa and muscularis with a catgut suture. A fine needle, carrying strong fine linen or silk thread doubled, transfixes the ureter through its center and picks up the full thickness of a one-fourth inch fold of mucous membrane of the intestine. *C*, the muscular and peritoneal wall of the intestine is being drawn over the transfixed ureter. *D*, sectional view of transfixion operation. *E*, final results of anastomosis by the transfixion method.

angle of the caudal end of an uncompleted intestinal incision. The anastomosis is complete within two to four days after operation (fig. 2).

RELATIVE IMPORTANCE OF THE THREE TYPES OF TECHNIC

Technic 1, by virtue of its fifteen years of priority, has been used in a greater number of cases in the transplantation of the ureters than has any other operation

While each of these two types of operation has its special field, they have a common defect or danger in that they both require the making of a definite opening through the intestinal mucosa, which leaves the wound in the intestinal wall exposed directly to the organisms resident in the large intestine. It is this feature, rather than infection ascending along the course of the ureter to the kidney, that is the greatest danger in the transplantation of the ureters. Most of the mortality in

connection with transplantation of the ureters is directly attributable to infection in or emanating from the wound in the intestinal wall.

In March, 1930, technic 3 was introduced and described. In experimental operations on dogs, results from this operation have been incomparably better than by any other type of operation. The suture has in no instance failed to cut through and make an anastomosis. Peritonitis has not developed in any case. The dogs, instead of being sick for days or weeks after the operation, are playful within two or three days, scarcely giving evidence of having had an operation. The immediate and remote results in animals have been ideal. The opening has remained patent even many months after the operation (fig. 3).

REPORT OF CASES

I am able to report three clinical cases in which this operation has been performed:

CASE 1.—April 30, 1931, Dr. Harold Brunn of San Francisco operated on a boy, aged 8 months, for exstrophy of the bladder. I submit his report as he made it to me. The left ureter was first transplanted, followed by a rather high temperature for a week and an occasional excursion of temperature afterward, which caused him to delay the second operation. After the transplantation of the first ureter, urine appeared in the stool in about thirty-six hours, tested by methylene blue (methylthionine chloride, U. S. P.). July 22, he transplanted the right ureter through a separate right rectus incision. At that time he observed that there were only a few adhesions from the previous operation and, if anything, the procedure this time was more simple than the first. September 19, the bladder was excised. The child's weight on discharge was 19 pounds (8.6 Kg.) and his age was 14 months. Following the second transplant operation the fever was much less than after the first. April 29, 1932, Dr. Brunn wrote: "He is now 20 months old, is very lively, talking and laughing. The symphysis pubis is still separated considerably but his legs are straight and he runs very freely. When he walks, he has a slight waddle. He left Sacramento at 9:30 this morning and had not wet himself when he arrived at my office at 1:30. He seems to have good control. He weighs 25 pounds (11.3 Kg.). There has been no fever or any sign of kidney infection. I think, with you, that the operation is a very great improvement and very simple to do." The postoperative condition of the child can be inferred from figure 4.

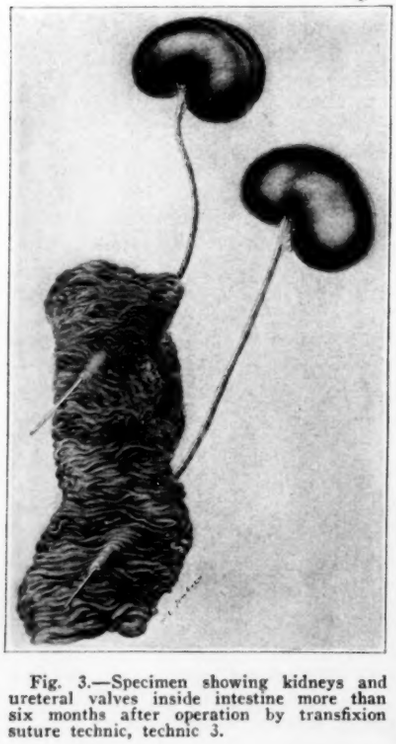

Fig. 3.—Specimen showing kidneys and ureteral valves inside intestine more than six months after operation by transfixion suture technic, technic 3.

CASE 2.—July 13, 1931, I operated on my first patient by this method. The left ureter was transplanted for exstrophy of the bladder in a baby, aged 20 months. After seventy-two hours, urine began to appear in the rectum as shown by the phenolphthalein test. After the operation the patient had a sharp rise of temperature on two or three occasions. Twenty-six days later the right ureter was transplanted higher up. There was evidence that the urine came through from this kidney even in a shorter time than the first, but it could not be proved by the phenolphthalein test in view of the fact that the left ureter was delivering its urine into the rectum. This was later proved, however, by the iopax test, which showed perfect function. In this case, an unfortunate accident occurred. In attempting to transplant my first ureter by this method, I was anxious to have the transplantation as low down in the rectum as possible so that I could see the transfixion suture through a speculum. In cutting through the muscle of the bowel wall in this some-

Fig. 4 (case 1).—Dr. Brunn's patient: left ureter implanted April 30, 1931; right, July 22, 1931.

what inaccessible location, my knife went a little too deep and opened the lumen of the bowel. This wound was closed and the site of operation was shifted to a slightly higher level. Infection emanating from this soiled field caused the formation of an abscess, which apparently detached the ureter from the intestine and produced a urinary fistula. It was necessary to reimplant it later (fig. 5).

CASE 3.—My second patient was a little girl, aged 2 years and 9 months. May 21, 1932, the left ureter was transplanted. On the third day after operation, urine began to appear in the intestine and on the fourth and fifth days the phenolphthalein test showed positive. On the fifth day the child had a rather sharp rise in temperature but did not appear to be particularly sick. She had other slight rises in temperature during the next few days but nothing that caused any alarm at all. July 1, forty days after the first operation, in the presence of the members of the western branch of the American Urological Association, the second ureter was transplanted. A marked increase in flow of urine into the rectum showed in forty-eight hours after operation. Convalescence was entirely uneventful and the little patient started for her home in Hamilton, Ohio, twenty-nine days after the last operation. She is perfectly well (fig. 6).

COMMENT

To avoid the danger of such an accident as happened in the transplantation of my first ureter by this technic, it is well to use a method which I have found very

important in making the intestinal incision for any ureteral transplantation. The intestine should be held by four traction loops, which, when possible, should include any visible vessel in the intestinal wall that may cross the proposed line of incision. With a very sharp lance pointed knife, the peritoneum and part of the muscular coat are cut. The knife is now turned flatwise and with the point of the knife the remaining muscle fibers are teased through with gentle strokes, which cause the muscle ends to separate without damage to the submucosal vessels or membrane. With the handle of the knife, the muscle coat is pushed back, exposing the outer surface of the intestinal mucous membrane. This part of the operation must be done very delicately.

Technic 3, because of its simplicity, seems destined to assume an important rôle. Based on experimental surgery on animals and the very limited experience reported herein, it seems safe to say, even now, that it is the method of choice for treating exstrophy of the bladder in young children and in case of accidental injury to a ureter in the course of an abdominal or a pelvic operation. Conceivably, after it has been more fully tried and developed, it may supplant other methods in all cases whenever two good kidneys are present. It must constantly be borne in mind that *simultaneous bilateral transplantation cannot be done by this technic.* Of three dogs in which bilateral transplantation was done by this technic, all died within forty-eight hours. It is not feasible in dilated ureters with damaged kidneys, in single ureters in which the other kidney has been removed for tuberculosis, or in cases of advanced cancer in which time is important.

Technic 2 has given remarkable results in patients with two good kidneys, such as are usually found in vesicovaginal and other types of fistulas. I have had no deaths in this type of case and under the circumstances would hesitate to use any other method. Nevertheless, it is a serious operation in the hands of those who are not well grounded in the principles and fine points of abdominal and intestinal surgery.

Technic 3 will be a much safer operation in the hands of one who is doing his first transplantation operation. This technic is attractive from another standpoint. It is so simple that it lends itself perfectly to experimental surgery, by which any surgeon preparing to do ureteral transplantation may readily perfect his technic before he attempts to do the operation on the human being. Most of my experimental work was done in my regular operating room. After I had completed the morning's work, an anesthetized dog was brought in and the operation performed, after which the dog was easily cared for outside without any special surroundings. I would not convey the impression that this operation is without danger, for the fate of the kidney depends on the accuracy of a very delicate operation. If the transfixion suture does not definitely penetrate both the lumen of the ureter and the lumen of the intestine, the kidney is lost. Sometimes it is difficult to isolate definitely a ureter from its surrounding connective tissue. The degree of tightness with which the transfixion suture is tied is important. It must be sufficiently tight to strangulate the tissues within its bite but not sufficient to cut through the intestinal mucous membrane at the time it is placed. I would especially urge the use of experimental surgery as preliminary training for the performance of this operation.

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REGIONAL ILEITIS

A PATHOLOGIC AND CLINICAL ENTITY

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We propose to describe, in its pathologic and clinical details, a disease of the terminal ileum, affecting mainly young adults, characterized by a subacute or chronic necrotizing and cicatrizing inflammation. The ulceration of the mucosa is accompanied by a disproportionate connective tissue reaction of the remaining walls of the involved intestine, a process which frequently leads to stenosis of the lumen of the intestine, associated with the formation of multiple fistulas.

The disease is clinically featured by symptoms that resemble those of ulcerative colitis, namely, fever, diarrhea and emaciation, leading eventually to an obstruction of the small intestine; the constant occurrence of a mass in the right iliac fossa usually requires surgical intervention (resection). The terminal ileum is alone involved. The process begins abruptly at and involves the ileocecal valve in its maximal intensity, tapering off gradually as it ascends the ileum orally for from 8 to 12 inches (20 to 30 cm.). The familiar fistulas lead usually to segments of the colon, forming small tracts communicating with the lumen of the large intestine; occasionally the abdominal wall, anteriorly, is the site of one or more of these fistulous tracts.

The etiology of the process is unknown; it belongs in none of the categories of recognized granulomatous or accepted inflammatory groups. The course is relatively benign, all the patients who survive operation being alive and well.

Such, in essence, is the definition of a disease, the description of which is based on the study, to date, of fourteen cases. These cases have been carefully observed and studied in their clinical course; the pathologic details have resulted from a close inspection of resected specimens from thirteen of fourteen patients operated on by Dr. A. A. Berg.

RELATIONSHIP OF REGIONAL ILEITIS TO OTHER BENIGN INTESTINAL PROCESSES

There exists in the medical literature a heterogenous group of benign intestinal lesions which have now and then been described under the caption of "benign granulomas." The latter loose term covers a multiplicity of conditions in which both large and small intestines may be involved; it includes all chronic inflammatory lesions of the intestine whose etiology is either unknown or attributable to an unusual physical agent. It represents a hodge-podge or melting-pot in which are thrown all those benign inflammatory intestinal tumors which are neither neoplastic nor due to a specific bacterial agent. Within this group one finds descriptions of foreign body tumors, chronic perforating lesions with gross inflammatory reactions, traumas of the mesentery with intestinal reactions, Hodgkin's granuloma, a late productive reaction to released strangulated hernias of the intestinal wall and numerous other and similar conditions. The so-called benign granulomas all present a tumor-like inflammatory mass which usually simulates carcinoma

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but which eventually unmasks itself as probably an infectious process of unknown causation. The multiplicity of the possible sites of gastric, intestinal or colonic involvement and the accompanying protean clinical manifestations defeat any effort to include them all in a clear cut clinical entity. The very confusion defies classification.

In this literature, however, there have appeared on occasions references and descriptions that approach the picture that we are about to describe. The entire literature of benign granulomas was reviewed in 1920 by Tietze,[1] who not only described his own cases but covered all previous medical publications. There is nowhere in his encyclopedic article a description which resembles that of regional ileitis. In 1923, Moschcowitz and Wilensky,[2] in describing four cases of benign intestinal granuloma, detailed one case of a disease involving the terminal ileum which closely resembled that in our cases. They grouped it with various other and similar colonic masses as granuloma. Mock[3] in 1931 again described granuloma, but included no example that resembled the cases we have studied.

Just as the generic term of typhus originally included various diseases, from which group eventually typhoid fever, Brill's disease, Rocky Mountain fever, tabardillo and others were split off, so, similarly, do we aim to disintegrate from the general group of varied diseases spoken of as a "benign granuloma" a specific clinical entity with constant and well defined characteristics, which we propose to name "regional ileitis."

PATHOLOGIC ANATOMY OF THE DISEASE

All the specimens obtained by resection were in patients who had been ill for at least a year. We therefore have no specimen exhibiting the very early phases of the disease. The latter are sometimes encountered at the operating table following an illness of from one to two weeks and diagnosed, as a rule, as acute appendicitis. At this time the terminal ileum is found thickened, soggy and edematous; the serosa is a blotchy red. The mesentery of the terminal ileum is greatly thickened and contains numerous hyperplastic glands. Owing to the possibility of spontaneous resolution, resection has never been performed at this stage, so that we have no knowledge of the intra-intestinal changes present at this time.

The inflammatory process is not, however, a static one, nor is the entire diseased segment affected at one time. The oldest lesions begin apparently at, or just oral to, the ileocecal valve, and the more recent ones are situated proximally. In some of our relatively early cases, we have found isolated lesions separated from the main hypertrophic mass by normal mucosa. These isolated areas are, in our opinion, the earlier and primary lesions of the disease; they consist of oval mucosal ulcerations, about 1 cm. in diameter, located on the mesenteric border of the small bowel and lying in the long axis of the intestine, where a sort of groove is naturally formed by the attachment of the mesentery.

The characteristic, fully developed hypertrophic process is, as a rule, limited to the distal 25 to 35 cm. (10 to 14 inches) of the terminal ileum, including the ileal side of Bauhin's valve and terminating rather abruptly at that point. The most advanced pathologic changes are present at the valve, which in some instances becomes converted into a rigid diaphragm with a small irregular opening. Proximally the severity of the process gradually abates, shading off into normal mucosa. The normal intestinal folds are distorted and broken up by the destructive ulcerative process and rounded and blunted by edema, giving a bullous structure to the mucosal aspect of the intestine, or frequently a cobblestone appearance of the surface of the mucosa may result. A series of small linear ulcerations lying in a groove on the mesenteric side of the bowel is almost always present. Whether these are the remnants of the original ulcerative lesions or whether they are mechanical erosions due to the formation of a *darmstrasse* by the shortening of the fibrotic mesentery, it is impossible to say.

The submucosal and, to a much lesser extent, the muscular layers of the bowel are the seat of marked inflammatory hyperplastic and exudative changes. As a result of these, the wall of the bowel becomes enormously thickened, frequently reaching two or three times its normal density. The lumen of the bowel is greatly encroached on, becomes irregularly distorted and, at times, is only large enough to admit a medium-sized probe. The intestine proximal to the involved segment frequently, but not invariably, becomes greatly dilated and may show superficial irregularly placed tension ulcers. When seen at the operating table, the involved loop is a soggy hoselike mass.

In the older phases of the disease, the exudative reaction is replaced by a fibrostenotic process, and the mucosa appears atrophic with occasional superficial erosions and islands of papillary or polypoid hyperplasia. The serosa loses its gloss and frequently exhibits tubercle-like structures on its surface. The mesentery of the affected segment is greatly thickened and fibrotic, as is the subserosal intestinal fat.

A marked feature is the tendency toward perforation. Free perforation into the peritoneal cavity has not been encountered in this series. The chronic perforation apparently occurs slowly enough to permit of walling off by adhesions to a neighboring viscus, to the parietal peritoneum or to the omentum. There is a marked tendency to the formation of internal fistulas, the sigmoid having been the seat of fistulous involvement four times and the ascending colon and cecum once each. The walled-off abscesses resulting from slow perforation into the peritoneal cavity are, as a rule, considered appendicular in origin. When drained, they give rise to chronic intractable fecal fistulas which defy attempts at simple closure because of the persistence of the underlying inflammatory disease in the bowel. Indirect perforation of the cecum may result from perforation of the ileum into the terminal mesentery with secondary cecal termination of the fistulous tract. Pericecal fibrotic and inflammatory changes which result from the proximity of the ileal focus to the cecum are probably responsible for the roentgenologic changes in the contour of the ascending colon and cecum, such as may be easily confounded with the defect of hyperplastic tuberculosis.

Microscopically, no specific features can be demonstrated. The stained histologic sections showed various degrees of acute, subacute and chronic inflammation, with variations in the predominance of polymorphonuclear, round cell, plasma cell and fibroblastic elements. In the early stages the lesion is a diffuse one, involving mainly the mucosa and submucosa, with the presence of some inflammatory serosal reaction. The mucous membrane shows areas of marked destruction, and at times the glandular structure is almost completely gone, leaving an atrophic layer of epithelium, the result of a regenerative process. In later stages of the disease, the

1. Tietze: Ergebn. d. Chir. u. Orthop. **12**: 212, 1920.
2. Moschcowitz, E., and Wilensky, A.: Am. J. M. Sc. **166**: 48, 1923; **173**: 374, 1927.
3. Mock, H. E.: Surg., Gynec. & Obst. **52**: 672, 1931.

inflammatory reaction is more focal in character. These focal areas of inflammation in the serosa give the appearance, on gross examination, of tubercles.

In some of the cases, the presence of giant cells is quite striking. Special stains have occasionally demonstrated the presence of large pale cells, or groups of cells, probably vegetable in nature, in the vicinity of the giant cells. They could be demonstrated frequently in all the layers of the intestine. These and the giant cells are probably not an essential feature of the pathologic changes in this condition. They are, more likely, accidental findings due to the inclusion of small particles of vegetable matter which have become entrapped in the ulcers, entered the lymphatics and become encapsulated in the process of healing. The resultant foreign body reaction around these nonabsorbable particles results in the presence of the giant cells. To some extent they may be contributory to the marked hypertrophic scarring which occurs. We believe that the attempts, by some authors, to classify this granulomatous condition as an unusual form of tuberculosis were, to a great extent, predicated on the assumption that the giant cells were, necessarily, evidences of tuberculosis.

It is quite likely that in the past this granulomatous condition was confounded with ileocecal tuberculosis, and so missed as a clinical and pathologic entity. The failure of the pathologic reports in our cases to substantiate a suspicion of tuberculosis led us to exericse still greater caution in eliminating a Koch infection as the etiologic agent. With the assistance of Dr. Paul Klemperer in determining moot points, sections from the various cases were again reviewed. No evidences of tuberculosis, syphilis, actinomycosis, Hodgkin's disease or lymphosarcoma were found. Guinea-pig, rabbit and chicken inoculations of triturated material from mesenteric glands and from the intestinal wall proved negative for tuberculosis in five cases. Löwenstein tubercle cultures were also negative in three instances. It is interesting to note that none of these clinical cases presented any evidence of pulmonary tuberculosis; there were no positive Wassermann reactions in this series.

The relation of appendicitis and previous operations to the development of the disease is of some interest. Half of the patients had been subjected to appendectomy before the final resection was performed. In about half of those cases, abnormalities of the terminal ileum were already noted at the time of that operation. In those cases in which there had been no previous appendectomy, the mucosa of the appendix was not involved, as might be expected from the fact that the disease stops on the ileal side of the valve. Inflammation of the outer coats of the appendix, due to the presence of adjacent inflammatory disease, was common.

THE CLINICAL FEATURES

Etiologically, young adults comprise the largest number of patients. Only two of the patients studied were over 40 years, the average incidence being at 32 years of age; the youngest patient was 17, the oldest 52. Males predominate over females in the proportion of nearly 2:1. There are no known predisposing factors.

Cases of regional ileitis run, in general, a fairly constant and typical clinical course. Most of the patients had been ill for from several months to two years before coming under observation. During this time the outstanding complaints were fever, diarrhea, continuous loss of weight and a progressive anemia. The clinical picture resembles that of a nonspecific ulcerative colitis.

Fever is rarely high, long periods of apyrexia being interspersed with shorter and irregular cycles of moderate temperature. Occasionally, though rarely, the temperature rises above 103 F. Some of the cases run the complete course without fever.

Diarrhea is usually an outstanding feature, though the number of movements and the intensity of the actions never approach those of a true colitis. The average patient has from two to four loose or semisolid daily defecations, sometimes with blood and always with mucus. The stools are rarely mushy or liquid and contain free pus, coagulated lumps of mucus and streaks of blood, but tenesmus is always lacking. There are none of the perianal fistulas, condylomas or perirectal abscesses that characterize the complications of true colitis, for in this disease the rectum and colon are never involved. At times, particularly when the stenotic factor predominates, as in the later periods of the course, constipation rather than diarrhea predominates.

Vomiting characterizes the stenotic type of cases, is never marked or persistent and is usually accompanied by abdominal pain and visible peristalsis.

Pain distributed over the lower abdominal parietes is a common feature of the disease. This pain is dull and cramplike and accompanies, or is followed and relieved by, defecation. It is usually localized to the right lower quadrant and is occasionally referred across the abdomen to the whole lower abdominal region. Occasionally, and not infrequently, when the sigmoid, as is not unusual, becomes adherent to the necrotizing hyperplastic ileum, fistula formation occurs between these two hollow viscera. In these cases the pain is mainly localized over the left lower abdominal quadrants; the mass which is then felt abdominally and per rectum may appear to be an integral disease of the rectosigmoid area.

The general symptoms are those of weakness, usually a rapid and progressive loss of weight, and an anemia which ordinarily is moderate, but which may progress to a severe degree. In the milder cases, however, there may be little or no emaciation and no anemia. The stools contain constantly occult blood. Appetite is poor, particularly during the febrile bouts.

A moderate leukocytosis characterizes some of the cases; in most, the white blood count is normal. Even in the stenotic cases the blood plasm findings that accompany marked obstructions of the upper alimentary tract are rarely seen.

PHYSICAL EXAMINATION

Certain physical findings characterize this disease, the most constant ones being (1) a mass in the right iliac region, (2) evidences of fistula formation, (3) emaciation and anemia, (4) the scar of a previous appendectomy and (5) evidences of intestinal obstruction.

1. A moderate-sized mass is usually felt in the lower right iliac region or in the lower midabdomen. The mass is usually the size of a small orange, tender, firm, irregular and only slightly movable. This mass is composed of the tremendously hyperplastic ileum, the stenotic inflamed ileocecal junction, which may and often does assume a size of from two to five times that of a normal valve of Bauhin, and frequently an adherent section of the colon or sigmoid to which a fistulous tract has been created. When the sigmoid is adherent and involved, the mass may lie more to the left; when the cecum or ascending colon or hepatic flexure constitutes the distal end of the fistulous tract, the mass may lie more to the right and higher in the abdomen. When the fistulous tract burrows into and through the mesentery, the necrotic process may cause a diffuse mesenteric suppuration which participates in the formation of the mass. The tumor is usually palpable per rectum, though felt only very high with the examining finger.

2. Fistula formation is a constant feature of the disease process. The most common site of adherence is the sigmoid; next in frequency is the cecum and the ascending colon and occasionally the hepatic flexure. As the necrotizing process of the mucosa of the ileum progresses through its several coats, the serosa becomes involved. Any hollow viscus, usually the colon, now becomes adherent to the point of threatened perforation. A slowly progressive perforation is thus walled off, but results in a fistulous tract being formed between the two viscera. In one case the uterus formed the limiting organ of a threatened perforation. In another case, on sigmoidoscopic examination, a nipple-like papillomatous projection was seen high in the rectum, or just above the rectosigmoid angle. This observation was noted at the time, but the proper interpretation was overlooked; it was the colonic end of a perforating fistulous tract. In still another case, the anterior abdominal wall presented a fecal fistula, particularly such as persists after a fruitless appendectomy. These fistulas are usually regarded as cecal in point of origin; they are always, however, communications between the necrotic ileum and the anterior abdominal wall.

3. There are evidences of emaciation and anemia.

4. In at least half of the cases the appendix had been removed at some previous operation. This appendectomy usually antedated by several months or years the present symptoms. In many cases the appendix had been removed several months previous, at which time thickening and tumor-like massive inflammation of the small intestine and mesentery had been noted, though nothing beyond the appendectomy had been attempted. It seemed quite evident that in these cases the lower right abdominal symptoms had resulted in the discovery or in the overlooking of the real pathologic process in the terminal ileum. In all such cases the pathologic report cited "acute and chronic inflammatory changes of the appendix," a report which really whitewashed this organ as a participant in the disease process. In fact, we now know that the process never transcends the limit of Bauhin's valve, and that the appendix is always free from guilt and free from changes.

5. In those cases in which the process has progressed to a stenotic stage, the physical findings are those of intestinal obstruction. Loops of distended intestine may be visible through the emaciated abdominal wall, and puddling is frequently observed in the flat x-ray plates. Visible peristalsis is not uncommon and is accompanied by borborygmus and the passage of gas with evident relief. The visible loops of the distended intestine are usually localized to the lower midabdomen. General distention and ballooning of the whole abdomen are unusual.

CLINICAL COURSE OF THE DISEASE

There are four various types of clinical course under which most of the cases may be grouped: (1) acute intra-abdominal disease with peritoneal irritation, (2) symptoms of ulcerative enteritis, (3) symptoms of chronic obstruction of the small intestine and (4) persistent and intractable fistulas in the right lower quadrant following previous drainage for ulcer or abdominal abscess.

1. *Signs of Acute Intra-Abdominal Inflammation.*—It is impossible to distinguish these cases preoperatively from those of acute appendicitis. There are generalized colic, pain and tenderness in the right lower quadrant and fever up to 101 or 102 F. The white blood count is elevated. The development of symptoms seems to be somewhat slower than in appendicitis. The presence of a mass even without actual abscess formation is a fairly constant feature. The picture encountered at operation is that of a greatly thickened, red or blotchy terminal ileum, with marked edema of the surrounding tissues and slight exudate of the ileal wall. The mesentery is thickened and edematous, and contains numerous large glands. There is usually clear fluid present in the abdomen. The appendix may appear, and shows evidence of a periappendicitis without mucosal involvement. In some cases an abscess is encountered; in our experience the pus has been thick and grumous, and not as foul smelling as an abscess of appendiceal origin. The future course of these cases cannot be predicted. Some seem to undergo resolution, others to pass into one of the more chronic phases of the disease. Those cases which are drained may develop intractable fistulas.

2. *Symptoms of Ulcerative Enteritis.*—These patients complain of colicky periumbilical or lower abdominal pain. There is a tendency toward looseness of the bowels (from three to five movements a day). The stool is usually liquid or mushy and contains pus, mucus and occult or visible blood. There is no gross melena. A constant fever is present, but the temperature is rarely above 100 F. With the progress of the disease, a marked secondary anemia may develop, reaching as low as 35 per cent hemoglobin. Considerable loss of weight and strength may occur. In some instances disturbances of general nutrition are slight. This course may continue for as long as a year until exhaustion sets in, or more commonly the cases pass gradually into the stenotic phase of the disease.

3. *Stenotic Phase.*—This is the type most commonly encountered. The symptoms in this stage are those of a subacute or small intestinal obstruction of varying severity. The obstruction, as in most obturating lesions of the small bowel, is not complete. Violent cramps, borborygmus, occasional attacks of vomiting and constipation are present. Visible peristalsis and intestinal erection are common. A palpable mass is practically always present in the lower right quadrant. In this phase of the disease fistulous communications with the colon or sigmoid may lead to the signs and symptoms of colitis, and mask the true nature of the disease. Occasionally the stenotic phase occurs as a primary manifestation of the disease; again, the symptoms may have been present for years (four years in one of our cases).

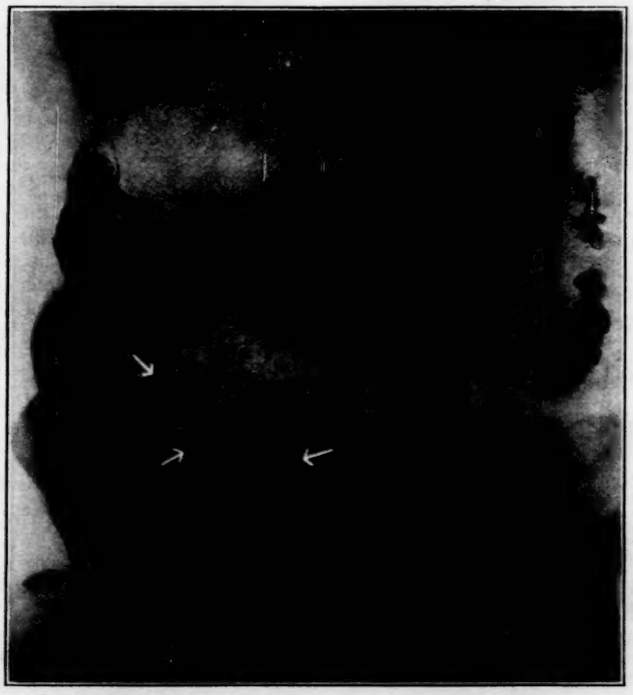
4. *Persistent Fistulas.*—Even before we had had a resected specimen to confirm our suspicion, we felt that a certain number of the persistent and intractable intestinal fistulas which followed on the drainage of a supposedly appendiceal abscess were in reality due to a nonspecific inflammatory disease involving the terminal ileum. This belief was founded on the following observations: 1. In a number of instances at the time of the second or third operation for closure of the fistulas, the appendix was found intact and not diseased. 2. Removal of the specimens from the sinus tract and from the intestinal end of the fistula failed to reveal any evidence of tuberculosis or other specific disease. 3. The occurrence of ileal without cecal origin of the sinus tract was noted. 4. The tendency of fecal fistulas of simple appendiceal origin is to close spontaneously or to be susceptible of closure by excision of the tract and inversion of the stump. However, in two instances resection of the intestine and fistulous tract revealed the typical pathologic picture of ileitis. We assume, therefore, that fistulas which are of supposedly appendiceal origin, but which have ileal openings and which have resisted simple surgical closure are, in the absence of

tuberculosis, to be considered as cases of regional ileitis. One peculiar feature of these fistulas may be remarked: They may develop a few months after the original drainage operation, the wound meanwhile having healed and having remained healed for a few months. An abscess then develops in the wound; when this abscess mass is investigated, a communication with the intestine may be demonstrated.

ROENTGENOGRAPHIC OBSERVATIONS

Two outstanding facts, one negative and the other positive, are regularly noted. Since the disease simulates regularly the clinical characteristics of ulcerative colitis, the barium enema is first attempted. This procedure results in a negative report. The reason for this is evident in the light of the pathology of the disease. The colon is uniformly free from changes, even though the ileocecal valve is the seat of greatest intensity of the process.

The barium meal, however, when carefully interpreted, gives definite positive findings. These usually consist of distended loops of terminal ileum, in which a fluid level is discernible, and a definite delay in motility of the meal through the distal end of the small intestine. In the four, six and nine hour observations this delayed motility is usually present, though only in the late or stenotic stages is the delay striking. The milder degrees of stasis and puddling in the ileal loops may easily be overlooked by any but a careful roentgenologist. Even when the condition is plainly indicated, the true significance of these reported results may be glossed over by the clinician and an exact diagnosis may thus be missed.



Roentgenogram of the barium meal given by mouth, showing regional ileitis. Note the extent of the strictured area.

When the ascending colon is the seat of a fistulous communication with the ileum, one may note some stricture deformity of the ascending colon or hepatic flexure, with delayed motility at this point. When the sigmoid is similarly involved in a fistulous tract, a true narrowing and delay at this flexure may simulate carcinoma and so create the necessary indication for operation. Both these areas of stenotic deformity of the large bowel are incidental to only one of the complications of the disease, namely, the formation of fistulous tracts. The entire colon is otherwise exonerated as a primary site of the granulomatous inflammation.

DIFFERENTIAL DIAGNOSIS

Regional ileitis must be differentiated from several analogous conditions which produce a mass in the right iliac region with diarrhea and fever. The most important differentiation is that of regional ileitis from nonspecific ulcerative colitis. The sigmoidoscopy and the barium enema suffice for the recognition of colitis in the largest percentage of cases. But there are types of colitis which involve only the proximal segments of the colon, and in which the sigmoid and the rectum are free from pathologic changes. While these instances are few and relatively uncommon, they do occur and lead to much confusion; they may be recognized by the deformity and spasm of the cecum and ascending colon when the latter areas are the seat of the segmental phenomena of colitis. Only in severe cases of ulcerative colitis does the process involve the terminal ileum, and then only for a few inches. In regional ileitis, all of the damaged tissue is proximal to the valve. The diagnosis is purely roentgenographic, the clinical differentiation being impossible. Colitis does not cause fistulas except about the anus and rectum; a mass is rarely palpable in colitis.

Ileocecal tuberculosis as a primary process should be easy of differentiation from regional ileitis. We are inclined, however, to agree with Moschcowitz and Wilensky [2] in the skepticism with which they view the actual occurrence of a primary tuberculous process at the ileocecal junction. To repeat their arguments, the latter disease must be rare, for only three cases have been seen at Mount Sinai Hospital in several years. Pathologic examination of all such suspected tuberculous masses has uniformly failed in the demonstration of tubercles or of tubercle bacilli in the sections or smears. Practically all cases mistakenly suspected of, or diagnosed as, ileocecal tuberculosis have been eventually classed as new growth, as appendicitis with abscess or as benign nonspecific granuloma. In all of our first cases of regional ileitis the diagnosis of ileocecal tuberculosis was the unvarying best possibility; operation was undertaken only after the customarily accepted methods of treatment for tuberculosis had been exhausted.

Fibroplastic appendicitis or typhlitis is a disease better known to the surgeons.

Lymphosarcoma, intestinal or mesenteric tuberculosis and Hodgkin's disease simulate regional ileitis in many of its features. The exact differentiation is possible only at the operating table or by the examination of pathologic specimens. Sarcoma of the intestine is usually multiple, causing dilatations at various levels, and involves the jejunum as well as the ileum and not particularly just the terminal 8 to 12 inches of the small intestine. Hodgkin's disease may give its characteristic monocytic blood picture, or a regional lymph node may reveal the true nature of the process.

Actinomycosis of the ileocecal region with fistula formation to the external abdominal wall must always be mentioned in the differentiation from ileitis. The extreme rarity of actinomycosis in this region of the body and in this climate makes this differentiation more theoretical than necessary.

From carcinoma of the terminal ileum or of the ileocecal valve the differentiation cannot be made with any certainty; both conditions call for surgical intervention and both lead to cure by successful and early resections.

TREATMENT

Medical treatment is purely palliative and supportive. The diseased area cannot be reached by colonic irrigations or enemas, and any attempts by medical means to reach a necrotizing, ulcerating and stenosing inflammation of the terminal ileum is purely and essentially futile. True, one case, discovered in the course of a cholecystectomy for stones, progressed to spontaneous healing or at least to a cessation of the intestinal symptoms.

But in general, the proper approach to a complete cure is by surgical resection of the diseased segment of the small intestine and of the ileocecal valve with its contiguous cecum. The restitution to complete health in thirteen out of fourteen cases as a result of the radical resection of the pathologic process or of a short-circuiting operation speaks vehemently in favor of surgical methods as the logical successful therapeutic procedure.

In one instance recurrent symptoms were accounted for by the finding of an annular stenosis a short distance proximal to the new anastomosis (ileotransversostomy). Apparently in this case the resection had not been carried out sufficiently oral to the lesion completely to eradicate the disease.

Our experience with short-circuiting anastomoses is limited. In one case a short-circuit ileocolostomy was performed through a segment of ileum that was apparently normal at the time of operation. The pathologic process did not heal; on the contrary, the disease progressed to the proximal loop of the anastomosis. In two cases of intractable fistulas and in one case of inflammatory pelvic mass, ileocolostomy with exclusion has given excellent results. The best operation, as devised by Dr. A. A. Berg, consists of dividing the ileum 3 feet (91 cm.) from the ileocecal junction, closing both ends of the divided ileum and implanting the proximal terminus of the ileum by a side-to-side anastomosis at the transverse colon.

ABSTRACT OF DISCUSSION

Dr. J. A. Bargen, Rochester, Minn.: This presentation would seem timely, for, with improved roentgen technic and more intensive study of intestinal disease, the condition may prove to be less common than it is now supposed to be. Intensive roentgenologic investigation often becomes necessary to determine the nature of disturbances of the ileocecal coil. Undoubtedly some of these cases have been overlooked. In the last few years, several cases annually of this type have come to operation at the Mayo Clinic. Usually the appendix has been removed for complaints similar to those for which the patients presented themselves, that is, recurrent and intermittent attacks of right abdominal pain and discomfort. Some of these conditions were diagnosed preoperatively because of the suggestive roentgenographic and roentgenoscopic signs. The lumen of the intestine in this region is narrowed, and the wall is thickened and shortened. The gross appearance of the removed specimen resembles closely that of the colon in advanced chronic ulcerative colitis. The lesion is inflammatory, containing fibrotic elements and granulation tissue as well as evidence of more acute changes. The evidence points to a regional inflammatory disease perhaps on the basis of localized decrease in resistance to some bacterial invasion. I am wondering whether the designation "terminal" is adequately descriptive. To some it has conveyed the meaning of agonal. Perhaps the modifying adjective "regional" or some other word suggesting its localized nature, instead of the end, would be more suitable. I should like to emphasize that this presentation is an important one, that possibly these cases will be discovered earlier and more frequently in the future, and if so, one instead of two operations may be performed, and that I believe the lesion is infectious.

Dr. Julius Friedenwald, Baltimore: I am reminded of two cases quite a number of years back in which this condition was evidently present but which were regarded at the time as instances of carcinoma. Both patients, men, presented almost identical symptoms; the one was 50 and the other 58 years of age. The condition arose in the midst of good health and was associated with rapid loss of flesh, diarrhea, indigestion, slight fever and anemia; it terminated in progressive constipation and in attacks of partial and almost complete obstruction. In both instances an indefinite mass could be detected in the cecal region. At operation an extensive obstructive mass was detected in the terminal ileum. A diagnosis of inoperable carcinoma was made by the surgeon and a lateral anastomosis performed. The patients made a surprisingly rapid recovery and remained well. The recovery could not be explained at the time, but the condition was evidently ileitis, as described by the authors. Since then I have observed a number of instances of a milder type which at operation presented a somewhat similar appearance. In a woman, aged 62, who was operated on about two years ago and who presented symptoms of lower right-sided abdominal pain with loss of flesh and attacks of alternating diarrhea followed by intense constipation, this condition was observed in the terminal ileum in a mild form. The surgeon, not realizing its significance, simply removed a chronically inflamed appendix. Since then the attacks have continued, the distress becoming more marked. The authors have undoubtedly described a clinical entity of great importance, a condition that may occur in so severe a form as to simulate carcinoma or intestinal tuberculosis or, in a milder form, presenting the appearance rather of a chronic appendicitis. The possibility of its occurrence must constantly be borne in mind in the differential diagnosis of chronic abdominal disease.

Dr. Louis J. Hirschman, Detroit: I have just such a case under my observation, which presents an interesting phase which has not come under the observation of the authors, at least but rarely, as I recall their paper. This is a youth, aged 18 years, who has been suffering from chronic ulcerative colitis since 9 years of age, half his life. His weight has gone down in the last few months to 78 pounds (35.4 Kg.), so much so that when he was sent to me for surgical relief for his chronic ulcerative colitis, having hemorrhages, I decided on intestinal rest, and enterostomy was performed. A diagnosis of benign papilloma of the ileum was not made. He was sent for relief from the chronic ulcerative colitis. At operation, about 12 inches (30 cm.) of a large, doughy, thickened ileum was discovered. It was resected and ileostomy done, with immediate relief. The appendix also was involved. It was done about eight weeks ago and the patient has gained weight so that he weighs now about 130 pounds (59 Kg.). The interesting point to me is that when the specimen was opened the ileum was almost occluded with granulomas. It was a wonder he had any peristalsis or intestinal movement. I gathered from what the authors said that it is uncommon to have an ulcerative colitis in connection with a granulomatous infection of the terminal ileum. In this case there was no evidence of fistulas in connection with either the terminal ileum or the large intestine and I wondered why, since there is the granulomatous formation they described.

Dr. Sidney A. Portis, Chicago: What were the bacterioscopic observations on the excised portion of the ileum? Did you make any sections of the ileum to find out whether any bacteria were deeply seated in the walls of the ileum?

Dr. Burrill B. Crohn, New York: In a disease of this type, in which an attempt is being made to establish the etiology of the disease, we have naturally taken great pains to exclude every known etiologic factor. Histologic sections were made of the tissues and stained with various types of stains. Cultures were made. Ground material was injected into guinea-pigs and fowl. Various types of laboratory animals were used to eliminate any possible form of tuberculosis. Löwenstein cultures were made. Dr. Klemperer, the pathologist, exhausted

all the known possible scientific methods of finding an etiologic factor. I can say that no etiologic factor was found. It is refreshing to address a medical organization of this kind, where one can count on meeting men of large clinical experience and find that Drs. Bargen, Friedenwald and Hirschman have seen cases of this type. I have not had many occasions, in fact this is the first, to read this article. I have spoken extemporaneously at one or two previous meetings and wherever I spoke of this subject, the older clinicians, men with broad experience, surgical or medical, always have said: "We have seen such a thing in past years. We have met with it in surgical experience and didn't know what to do with it." The chairman of the New York Surgical Society, at the time the subject was brought up, said: "I have to operate in such a case and I don't know what to do. I don't know the nature of it." I forgot to mention an important physical sign; namely, the mass that occurs. In these cases a mass develops in the lower abdomen, usually in the right ileac region, consisting of agglutinated coils of ileum massed together. Sometimes the mass will move over from adhesions to the sigmoid and will present more in the left lower abdomen. The mass can usually be felt by rectum. It is a hard mass and a movable mass. It does not feel carcinomatous, though I must say some of the best cases we met had previously been condemned as inoperable carcinomas. In addition to the agglutinated loops of ileum, an inflammatory reaction is set up by the fistulas that travel through the mesentery of the ileum to the loops of the colon. I am thankful for the discussion. I had come to the conclusion that only the abdominal surgeons knew about the condition. I am glad to find that men with older and larger medical experiences have also met with the manifestations of the disease.

DR. FRANK SMITHIES, Chicago: You never found free fluid, did you?

DR. CROHN: Yes, a small amount, not demonstrable by physical signs but a small amount such as one would find in any inflammatory peritoneal lesion—real ascites.

PHYSOSTIGMINE, A PERISTALTIC STIMULANT

P. F. BUTLER, M.D.
AND
MAX RITVO, M.D.
BOSTON

About five years ago, at the suggestion of Dr. Soma Weiss, we began using physostigmine to increase gastric tonus and stimulate peristaltic activity.[1] We found this drug to be of great value in the roentgen examination of the gastro-intestinal tract, and have used it with satisfactory results since that time. Our series now numbers over 1,200 patients and we deemed it of interest to report a summary of our observations in these cases.

Roentgenologists are familiar with the type of patient in whom the roentgen study of the stomach is made difficult if not impossible by the presence of a marked degree of atonicity, absent or sluggish peristalsis or spasm. In these instances, even after prolonged periods of fluoroscopic observation, it is often impossible to obtain satisfactory visualization of all portions of the stomach; or defects may be present without its being possible to determine whether they are due to organic lesions of the stomach, extrinsic pressure or spasm. Spastic deformities in particular may persist for long periods and be confusing. In the past, various maneuvers have been resorted to in the endeavor to overcome these difficulties. Deep breathing, reassurance and periods of rest during the fluoroscopic observations may be successful in a small proportion of cases. Pressure over the abdomen with the gloved hand or special instruments may be helpful; such manipulation often causes pain or discomfort, however, thereby defeating its own purpose and making the examination still more difficult and unsatisfactory. Atropine has been used in many clinics for years. Most observers agree that atropine even in large doses does not relax spasm of the stomach or pylorus, and this drug is falling into disuse. Amyl nitrite is useful in relaxing spasm of the colon, but is not effective in gastrospasm. These methods are time-consuming, not availing in most instances and may be attended by unpleasant side-effects. This problem has remained a vexing and difficult one, and roentgenologists have long desired its solution.

With physostigmine, it is possible to increase gastric tonus and stimulate peristaltic activity. With the aid of this drug, the routine roentgen examination of the stomach can be completed in a much shorter time than otherwise in the difficult cases with atonicity, absent or sluggish peristalsis or spasm. This lessens the fatigue and exposure to radiation of both the patient and the physician. We also feel that physostigmine has enabled us to attain a much greater accuracy of diagnosis in difficult or doubtful cases than would otherwise have been possible.

The first effect observed after the administration of physostigmine is an increase in tonus. This change occurs within from three to ten minues and is present in every patient to whom this drug is given. The stomach contracts and becomes much smaller than previously. The outline is distinct and clear, the margins of the stomach shadow being thrown into sharp relief. This is of particular importance in the examination of patients in whom the stomach is dilated, with hazy, indistinct borders. The increased tonicity lasts from about twenty minutes to one hour. After the effect of the drug disappears, the stomach returns to its previous condition and does not appear to be left in a tired-out state.

The increase in peristalsis usually begins within from five to fifteen minutes after the administration of the drug and lasts from a few minutes to half an hour. The waves are deep and powerful as a rule. From two to six waves may be present simultaneously. The opaque meal is forced into every portion of the stomach and through the pylorus, so that both the gastric and the duodenal outlines are visualized with distinctness and clarity. If there is an indurated lesion or organic filling defect in the stomach wall, the peristaltic waves are arrested or broken up at the site of the lesion. If the defect is due to spasm or pressure, the waves are observed to pass directly through the area in question. With pylorospasm particularly it frequently requires the expenditure of much time and effort to visualize the pyloric sphincter and duodenum, and in some instances it is impossible to observe these structures satisfactorily even with long periods of observation. After the administration of physostigmine, the increased peristalsis forces the barium mixture through the pylorus, enabling the roentgenologist to complete the examination in a much shorter time and with a much greater degree of accuracy.

Read before the Section on Radiology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

Because of lack of space this article is abbreviated in THE JOURNAL by the omission of some of the illustrations. The complete article appears in the author's reprints.

1. Ritvo, Max, and Weiss, Soma: Physostigmine as an Aid in Gastro-Intestinal Roentgen-Ray Diagnosis, Am. J. Roentgenol. **18**: 301 (Oct.) 1927.

Gastric ulcers and early malignant growths of the stomach are demonstrated much more easily than otherwise. In extensive carcinoma of the stomach, the nature and extent of the lesion can be determined with greater ease after physostigmine. Duodenal ulcers are visualized more clearly after the use of the drug because of the larger amounts of barium entering the duodenum. With obstruction of the pylorus and duodenum, the drug is of great assistance not only in localizing the site of the obstruction, but also in demonstrating the nature of the obstructing lesion. It would appear on theoretical grounds that physostigmine is contraindicated in pylorospasm. This is not the case, however. The drug may increase the amount of spasm to a certain extent, but the increased peristaltic activity is usually sufficient to overcome the spasm and force the barium meal out of the stomach. Extrinsic defects due to pressure from masses adjacent to the stomach often disappear after the administration of this drug. After gastric resection, gastro-enterostomy and similar operative procedures, the stomach is usually atonic and peristalsis is sluggish or absent. In this type of case the use of physostigmine is frequently of great assistance in ruling out the presence of a recurrence or the development of a new lesion. In the pyloric obstruction of infancy, in which it is important to distinguish between spasm and stenosis, we have found this drug of great aid in differential diagnosis.

The effect of physostigmine on peristalsis is not so marked or constant as its effect on tonus. The drug increases tonicity in practically every case in which it is used. Even tremendously dilated and markedly atonic stomachs become contracted and show increased tonicity. In many instances this in itself is sufficient to permit of completion of the roentgen studies satisfactorily. In from 75 to 80 per cent of the cases in which we have used the drug, there has been observed a definite and marked increase in peristaltic activity lasting from a few minutes to half an hour. In about 15 per cent of our patients, the first dose has been ineffective and it has been necessary to give a second dose in order to produce the desired result. In from 5 to 10 per cent of the cases, even two doses have

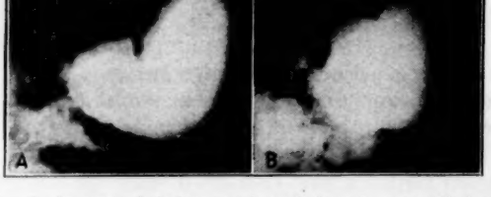


Fig. 3.—*A*, the stomach is hypertonic and there is spasm of the pylorus. The duodenum could not be filled. *B*, after one-twenty-fifth grain (2.6 mg.) of physostigmine sulphate orally, the increased peristaltic activity has forced the barium mixture into the duodenum and demonstrated clearly the typical deformity of a duodenal ulcer.

produced only a fleeting or no change in peristalsis. As the increase in peristalsis is not constantly noted and may be of short duration, it is essential that frequent short fluoroscopic observations be made after the drug is given. The periods of peristaltic activity may be alternated with intervals in which peristalsis is sluggish or absent, although in many cases the deep, vigorous waves are present throughout the time in which the drug is effective. The fluoroscope is essential for the study of the stomach after the administration of physostigmine; with the use of films alone the periods of activity may be missed entirely. A reasonable amount of expedition in carrying out the fluoroscopic studies and the taking of films is also advisable in order that the examination may be completed before the effect of the drug disappears.

The method of using physostigmine varies with the individual case. We have found it effective orally and have never deemed it necessary to use injection methods. For the average adult the optimum dose is one-twenty-fifth grain (2.6 mg.) by mouth. In thin persons one-fiftieth grain (1.3 mg.) may suffice, while stout

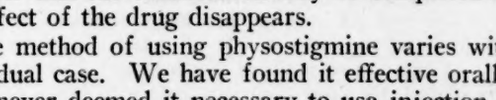


Fig. 4.—*A*, before physostigmine, the stomach is atonic with absent peristalsis. The pylorus and duodenum could not be visualized. There is a questionable ulcer on the lesser curvature of the stomach. *B*, after one-twenty-fifth grain (2.6 mg.) of physostigmine sulphate orally, the stomach has contracted and the ulcer is clearly demonstrable in the region of the media.

patients may require one-seventeenth grain (3.9 mg.). In children from one-one-hundredth to one-two-hundredth grain (from 0.6 to 0.3 mg.) is given, depending on the height and weight of the patient. We have found the most convenient form of obtaining this drug to be the small vials of tablets prepared by any one of several drug manufacturers for hypodermic use. Either physostigmine sulphate or physostigmine salicylate may be used. We prefer the tablets of one-fiftieth grain (1.3 mg.) each, and give one, two or three of these, the average dose being two tablets as already stated. These are allowed to dissolve under the tongue or are swallowed with a sip of water. If the effect is not sufficiently pronounced after the first dose, an additional tablet of one-fiftieth grain (1.3 mg.) may be given after an interval of twenty minutes. As previously noted, even this dosage may not produce peristaltic activity in all patients. We do not feel it advisable to exceed this dose, however, unless there are special indications. In the occasional case which shows insufficient increase in peristalsis by this method, the drug may be given subcutaneously, the dosage being proportionally reduced. It is our experience that the increased tonicity practically always gives enough data to permit of a diagnosis, even though increased peristalsis is not observed, and we prefer not to risk unpleasant reactions by increasing the dosage excessively.

As a rule, we start the routine roentgen examination of the stomach in the usual way, allowing the patient to ingest the barium meal while standing behind the fluoroscopic screen. The esophagus and stomach are observed for from five to ten minutes. If there is marked atonicity of the stomach, sluggish or absent peristalsis or spasm of sufficient degree to prevent satisfactory completion of the examination, the patient is given the dose of physostigmine deemed proper and instructed to swallow the tablets or to allow them to dissolve under the tongue. After the lapse of two or three minutes, fluoroscopic observations are again begun and carried on at frequent intervals till the desired

information is obtained. The patient is studied in the erect and recumbent positions, as ordinarily, and the routine films are then taken. As previously stated, it is advisable not to prolong the examination unnecessarily as the effect of the drug may wear off. The subsequent six hour and twenty-four hour observations may be carried on as a routine, as the drug usually causes no interference with motility. If, however, there are toxic manifestations, as will be explained later, the six hour and twenty-four hour tests cannot be made at this time and must be repeated at a later date. The fact that the stomach is filled with the barium meal does not appear to interfere with the absorption of the drug. If the stomach empties too rapidly to permit a satisfactory examination, a second barium meal should be given; this may obviate the necessity of repeating the observations at a later date. In some instances, it is preferable to complete the entire routine studies of the stomach and bowels before giving the drug, even though the observer does not obtain all the information that he desires at this time. Then after an interval of one or more days, the stomach is reexamined with physostigmine. This reexamination may be carried out either by giving the physostigmine first and the opaque meal immediately afterward or vice versa.

Reactions and unpleasant side-effects occur in a small number of cases, in our experience in from 1 to 2 per cent of those who receive the drug. These manifestations are malaise, headache and nausea in the mild cases. The more severe reactions consist of vomiting, sweating, cramps, diarrhea and faintness. In none of our cases did collapse or other symptoms of severe intoxication occur. If toxic effects occur, the motility of the gastro-intestinal tract is interfered with, and this must be taken into account if six hour and twenty-four hour observations are made; usually there is hypermotility and even diarrhea, although in some instances there may be hypomotility. In atropine we have a direct physiologic antidote to physostigmine, and reactions may be controlled by the administration of atropine. If the symptoms are mild, the patient is allowed to lie down, which suffices in most cases. With moderate reactions, one-one-hundredth or one-

Fig. 7.—*A*, there is poor filling of the prepyloric region, probably caused by carcinoma of the stomach. The area in question filled but poorly at all times. *B*, after physostigmine, the stomach shows increased tonus and active peristalsis. The lesion in the antrum of the stomach is sharply outlined.

fiftieth grain (0.6 or 1.3 mg.) of atropine sulphate is given by mouth; this dose may be repeated once in from fifteen to thirty minutes if required. If severe intoxication occurs, it is advisable to give the atropine subcutaneously, as the absorption of this drug may be delayed. We always keep a supply of one-one-hundredth grain (0.6 mg.) tablets of atropine sulphate on hand, but have only rarely been required to use this drug.

There are few contraindications to the use of physostigmine. It should not be used in cases of acute intestinal obstruction, peritonitis or appendicitis; as these types of cases are not referred for roentgen studies of the alimentary tract as a rule, they hardly need be mentioned. In patients with iritis, physostigmine must not be given because of the resultant contraction of the pupil. As a general rule, we recommend that this drug be not administered to patients with inflammatory conditions or redness of the eye unless atropine is given immediately on completion of the examination. In advanced pregnancy and severe cardiac lesions, physostigmine is also contraindicated.

Fig. 8.—*A*, pyloric obstruction with a dilated stomach. *B*, after physostigmine, the stomach is hypertonic with vigorous peristalsis.

It will be noted that the contraindications are few in number and that they can be determined by the history or by simple observation of the patient.

SUMMARY

Physostigmine increases gastric tonus and peristalsis.

This drug is of great benefit in the roentgen examination of the stomach in patients with absent or sluggish peristalsis, marked atonicity or spasm.

Physostigmine enables the roentgenologist to complete his studies of the stomach in a much shorter time and with a greater degree of accuracy in the aforementioned types of cases.

The average dosage is one-twenty-fifth grain (2.6 mg.) orally, the drug being effective when given by mouth. This obviates the need of injection methods.

The administration of physostigmine does not, as a rule, interfere with the routine roentgen studies of the gastro-intestinal tract.

Reactions are but rarely encountered, and since atropine is a physiologic antidote to physostigmine, toxic manifestations are controlled without difficulty.

ABSTRACT OF DISCUSSION

DR. ERNEST C. SAMUEL, New Orleans: Up to the present I have not found any necessity for using physostigmine, probably because I do not know just exactly what its effect would be. I have depended entirely on atropine and palpation. I think that it is necessary to be a little cautious, as Drs. Butler and Ritvo have said, in the administration of physostigmine in the average run of patients. Probably a selection of cases will be made because certainly none of the bad effects that the drug can cause are desired. It is probably not an office procedure and more of a hospital procedure, so that if anything does go wrong the patient is in the hospital and can be taken care of properly.

DR. L. R. SANTE, St. Louis: I have used physostigmine in gastro-intestinal work for the past few years but only in the occasional case and not in the number of patients that the authors have reported. I should like to add my testimony to its helpfulness in certain instances. When there is a doubtful defect in the pyloric end of the stomach, when peristalsis is sluggish, the administration of physostigmine, even in small doses, is useful. I use fiftieth-grain tablets and often only one is necessary. The patient is given a fiftieth-grain tablet and allowed to lie on his side, and after about ten minutes he is

reexamined in the routine way. After he has been given a fiftieth-grain tablet and allowed to remain on his side for about ten or fifteen minutes, a distinct increase in peristalsis is witnessed. I shall mention only one instance in which this method was most useful. In this case there was failure of a gastro-enterostomy to function after operation, and this method was used with a great deal of apprehension. There was a forty-eight hour retention in the stomach without any visual change and without evident peristalsis. Physostigmine produced peristalsis and function of the gastro-enterostomy. This does not always work; however, in another similar case there was a long retention in the stomach and even the administration of physostigmine failed to produce peristalsis. It was strange. I thought at first that it was because the dose used was too small; but even when the dose was increased to a twenty-fifth grain, there was no visible peristalsis.

DR. P. F. BUTLER, Boston: We have had experiences similar to those related by Dr. Sante, in which it has not worked at all, but they have been rare. We have used it several times after operations on the stomach; I must confess it does not always work as well as it should. We have got into the habit of using the drug rather in a routine manner in all doubtful cases that take too long for routine examination. We find that it has a good deal of merit in that type of case.

CONGENITAL ELEVATION OF SCAPULA AND PARALYSIS OF SERRATUS MAGNUS MUSCLE

OPERATION

ARMITAGE WHITMAN, M.D.
NEW YORK

About nine months ago I was interested to see an inquiry addressed to the editor of THE JOURNAL as to the treatment of paralysis of the serratus magnus muscle. The reply was that no treatment had been devised.

I therefore take this opportunity to present an operation that has been employed in two cases, once for paralysis of the serratus magnus muscle and once for congenital elevation of the scapula—Sprengel's deformity. I am ordinarily not in sympathy with reports based on two cases. The operation in question, however, represents simply a mechanical principle, and its success may be demonstrated impartially, uninfluenced by the enthusiasm of either patient or operator. The first patient was operated on in July, 1929; the second, in April, 1931. Exactly as in a case of hernia, if recurrence may be expected, it is most likely to occur shortly following the operation, and its likelihood varies inversely to the postoperative time.

The operations hitherto at command have been those described by Mathieu,[1] Schrock[2] and Flatow.[3] These operations vary in minor points, but in the main consist in subperiosteal dissection of the scapula, drawing it downward and fastening it to the lowest possible rib with chromic catgut or silver wire.

It appeared to me that a rib was a mobile, plastic and insecure anchorage for the scapula. The scapula represents to the arm what the pelvis does to the leg, and its point of support should therefore be as firm as one can conceivably make it. The following operation was therefore devised.

Read before the Section on Orthopedic Surgery at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

1. Mathieu, Paul: Fixation thoracique de l'omoplate ballante, Bull. et mém. Soc. nat. de chir. **52**: 383, 1926.
2. Schrock, R. D.: Congenital Elevation of the Scapula, J. Bone & Joint Surg. **8**: 207 (Jan.) 1926.
3. Flatow, Felix: Die Operation des angeborenen Schulterblatt-Hochstandes, Arch. f. Orthop. u. Unfall-Chir. **27**: 474, 1929.

OPERATIVE TECHNIC

An incision is made from the tip of the acromion process inward and downward to the superior angle of the scapula and then down its vertebral border. The periosteum is incised and it and the attached muscles are stripped back, thus exposing the bone of the superior and vertebral borders of the scapula. Four

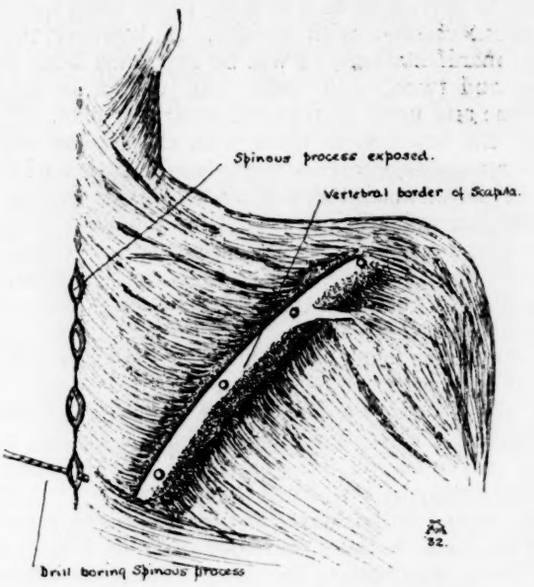


Fig. 1.—Exposure of the displaced scapula and of the spinous processes.

holes are then bored through the scapula with a drill, one at the superior angle, one at the junction of the spine and vertebral border, one in the middle of the vertebral border, and one at the inferior angle. The spinous processes of the fourth, fifth, sixth and seventh dorsal vertebrae are then subperiosteally

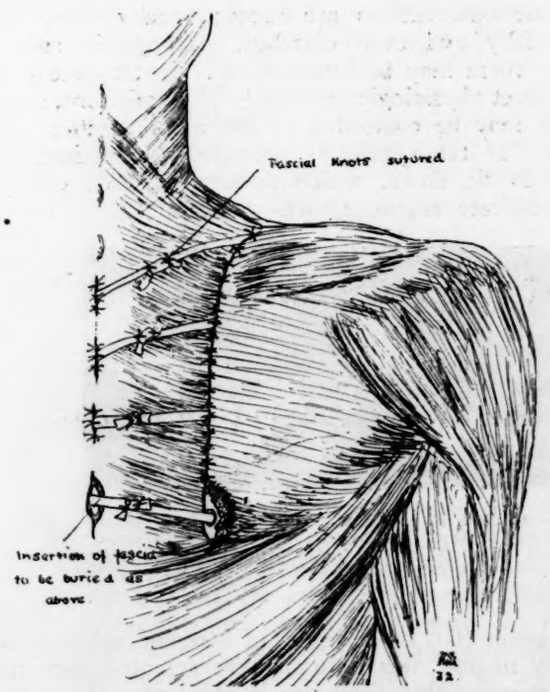


Fig. 2.—Operation completed; scapula sutured in position.

exposed as for a spinal infusion. They are similarly pierced with a drill. Four strips of fascia 8 inches (20.32 cm.) long and ¼ inch (0.63 cm.) wide have in the meantime been removed from the thigh by an assistant with a Grace stripper. These are passed through the corresponding holes in the scapula and spinous processes, and while the scapula is drawn downward and inward with sharp retractors, the strips are tied under

tension, providing satisfactory correction of the deformity. The periosteum of the spinous processes and the scapula is then further sutured over and to the fascial strips. The muscles, as far as they can be, are sewn in place, the subcutaneous tissue closed with plain gut, and the skin with silk. A shoulder spica is then applied, holding the arm abducted 45 degrees beyond a

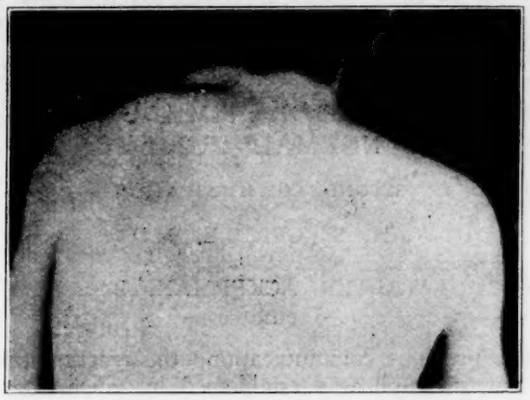


Fig. 3.—Congenital elevation of the scapula before operation.

right angle. The spica is retained for three weeks. The top is then removed and active motion started. At the end of the fourth week the plaster is entirely removed. At the end of eight weeks the patient is allowed full functional use of the extremity.

REPORT OF CASES

CASE 1.—J. P., aged 14 years, suffering from congenital elevation of the scapula, was operated on, July 22, 1929. The foregoing procedure was performed except that ox fascia was used, and the shoulder was strapped down as firmly as possible with adhesive plaster. The correction of the deformity left a large dead space, and a week later a hematoma was evacuated

Fig. 4.—Congenital elevation of the scapula after operation.

from the supraspinous fossa. When the patient was discharged, August 16, it was noted that his hand was cold and his fingers weak.

Two weeks later he returned to the hospital complaining of pain in the shoulder and down the arm. The neurologic consultant, Dr. Lewis Stevenson, made a diagnosis of motor, sensory and trophic changes due to tension on the brachial plexus, possibly due to its being stretched over the cervical rib, which was present on that side. On September 16, therefore, the plexus was exposed, and the cervical rib removed, apparently without effect on the nerves. All three cords of the plexus ran directly vertically downward and were stretched tight. It appeared that this tension was due to the downward displacement of the scapula and not to the cervical rib. The wound was then closed, and a shoulder spica applied, holding the arm in full abduction, with the aim of removing the tension as far as possible.

The spica remained on for a month, and when it was removed the patient showed a return of power to the extensors of the wrist, the biceps and the triceps. He returned to the physical therapy department for treatment, and in May, 1931, it was noted that his recovery was complete.

This complicating paralysis caused me considerable anxiety and is here reported as a warning against too energetic and sudden correction of the deformity.

CASE 2.—W. K., a man, aged 20, came to the hospital complaining of weakness of the right shoulder and inability to abduct the arm. His history was entirely indefinite, but numerous scars, including that of a mastoid operation and several as

Fig. 5.—Paralysis of the serratus magnus muscle before operation, showing angel wing scapula.

of a suppurative cervical adenitis, strongly suggested trauma to the long thoracic nerve. The patient was unable to abduct the arm, and on attempts to do so, and on pushing against resistance, the scapula assumed the classic "angel wing" appearance.

The operation described previously was performed, April 13, 1931. The top of the plaster was removed, April 28, and active motion begun. The plaster was entirely removed at the end of the month. The patient was discharged on May 19. June 25,

Fig. 6.—Paralysis of the serratus magnus after operation.

he returned, having been doing light work on the farm. He was last seen in October, 1931, when he expressed himself as satisfied with the result. He was able to use his right upper extremity as freely as his left.

SUMMARY

1. An operation for the relief of congenital elevation of the scapula and for paralysis of the serratus magnus muscle is described.

2. One case of each condition is reported.

3. An hitherto unreported complication of the operative treatment of Sprengel's deformity is described.

4. The operation is illustrated by diagrams, and the preoperative and postoperative condition of the patients is shown in motion pictures.

ABSTRACT OF DISCUSSION

DR. JOHN PRENTISS LORD, Omaha: My experience with the operative relief of congenital elevation of the scapula began shortly after visiting Sprengel, for whom the operation was named, in 1901. Perhaps it is not just proper for me to discuss how I have done it, but since it may have a bearing on the modified improved technic of present-day operations, I may be pardoned for referring to it. Having a general surgeon's experience behind me, I was bold in my attack and freely separated the osseous attachments to the lower cervical region present in the more extreme cases, made a wide excision of these structures, and then, by a series of oblique myotomies sufficient to overcome resistance, brought down the scapula. In one of the most marked cases there was an oblique osteotomy of the clavicle. These were in the more exaggerated cases requiring very free sectioning to restore the position of the scapula to its normal site and opposite its fellow. In those earlier experiences I used at first silver wire or phosphor bronze cable twist and later chromic catgut, anchoring the scapula to the rib. I afterward found that this was quite unnecessary, and I soon abandoned the use of any direct fixation except the suturing of the soft parts. In my earlier work I did use plaster of paris and later came to discard it altogether, and used adhesive plaster. This wide adhesive plaster should extend from the pelvis, of course, both anteriorly and posteriorly. I take it that my example in that regard was well thought of because Dr. Schrock, who later pursued the more modern technic in our work, began the use of the adhesive plaster, and I notice in his writings that he feels it is all that is necessary. Dr. Whitman admits that his correction and fixation were altogether too good to agree with the function of the nerve. I think that his opportunity to secure early movement after removing the cap of the plaster is an excellent idea and that his amount of fixation may be rather an improvement over the adhesive plaster method, although that method has served very well in my practice.

DR. JAMES A. DICKSON, Cleveland: The experience of most orthopedic surgeons is, of course, greatly limited in the treatment of Sprengel's deformity and paralysis of the serratus magnus muscle because of the rarity of these conditions, so that the best principles are as yet by no means standardized. Every one is agreed that there are two main points involved in Sprengel's shoulder: first, the difficult correction of the deformity, and, second, the fixation and the maintenance of this fixation of the scapula when the maximum correction has been obtained. Dr. Whitman has presented a new idea and his operation is logical. His method of maintaining this correction by means of leaving guy ropes of fascia should prove highly efficacious when one considers the good results obtained with living sutures elsewhere in the body. He eliminates all the irritating effects of foreign materials, as when silver wire is used. Another important point is that he uses a fixed point in the spinous processes to which he anchors the scapula. This is ingenious and sound and overcomes all the disadvantages of previous operations when fixation was made to a movable point, the rib. This eliminates also the possibility of the complication of a possible hemopneumothorax.

DR. PHILIP LEWIN, Chicago: The operation that Dr. Whitman describes is the reverse of one described by A. K. Henry in the English literature for the correction of "dropped" shoulder. Contrary to Dr. Whitman's statement, it is my understanding that Dr. Schrock does not secure his scapula by any mechanical means. He makes a little pocket in the muscles in the region of the inferior angle of the scapula and into that pocket tucks the inferior angle without any suture. I saw Dr. Schrock perform his operation on a cadaver in Iowa City last fall. Huc, a Frenchman, recently discussed the treatment of congenital elevation of the shoulder blades in his book, which I can recommend. He mentions that the clavicle has been termed the rudder of the shoulder joints. In cases similar to the first one described by Dr. Whitman, in which there was traction on the brachial plexus, the operation which Huc describes is similar in many respects to Dr. Whitman's. Through the same incision he performs a Z-shaped osteotomy of the clavicle and lengthens it. It may have some bearing on the prophylaxis or cure of this type of traction on the brachial plexus.

THE REACTION TIME OF THE NORMAL PUPIL

SECOND COMMUNICATION

H. S. GRADLE, M.D
AND
WALTER ACKERMAN, B.S.
CHICAGO

In a previous communication,[1] the reaction time of the normal pupil was established by cinematographic means. Briefly, it was found that when light is flashed on a normal eye that is accommodated for the dark, there occurs a latent period of 0.1875 second before the pupil begins to contract. Then there follows a rapid primary contraction for 0.4365 second at the rate of 5.48 mm. per second. This is succeeded by a secondary contraction of 0.3125 second at the slower rate of 1.34 mm. per second. These experiments were conducted on normal young persons, an 8 ampere arc light being used for illumination, and the pupillary play being recorded by a spring-driven cinematographic camera of constant speed. The films thus obtained were projected on a screen, frame by frame, and the pupillary diameters measured in the projected pictures. The relationship to the corneal diameter, which was measured in the living subject, gave the actual size of the pupil in hundredths of a millimeter.

Fig. 1.—The apparatus used in measuring the dilatation time of the pupil. The camera is under the fingers of the observer. The interrupter wheel has a fairly large black interrupter sector attached.

But the measurement of the dilatation time of the pupil, cinematographically, was a much more difficult task. It was accomplished in the following manner: The patient was seated comfortably with the chin on a chinrest. The 8 ampere arc light was focused on the eye, during which time the cinematographic camera

From the Department of Ophthalmology and the Department of Physiology of the Michael Reese Hospital of Chicago.

Read before the Section on Ophthalmology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Gradle, H. S., and Eisendrath, E. B.: Klin. Monatsbl. f. Augenh. 71: 311 (Sept.-Oct.) 1923.

(seen under the fingers of the operator in figure 1) was set, focused and fastened in position. Then the light-interrupting wheel was moved in so that its edge just grazed the illuminating beam. The wheel is a large wooden disk, 45 cm. in diameter, with its axis parallel to the illuminating beam. It was rotated at the rate of 3 revolutions per minute by a pulley drive from a reduced speed electric motor. To interrupt the beam of light for varying periods of time, black sector-shaped pieces of cardboard were attached to the sides of the wheel by thumbtacks, and as the wheel rotated, the sector cut off the light from the eye until the rotation

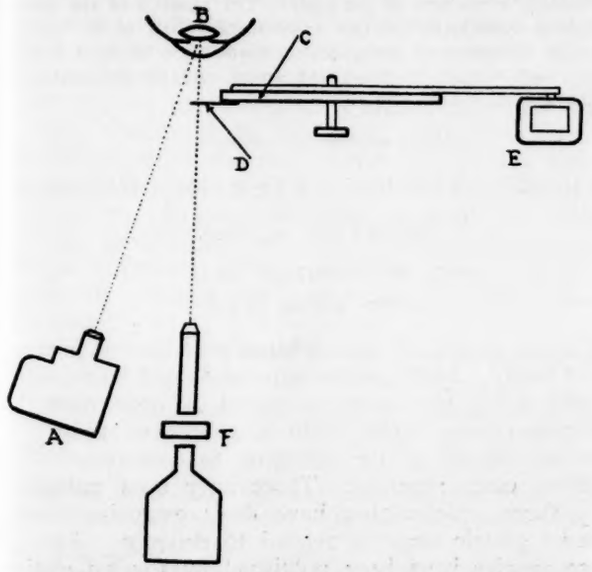


Fig. 2.—Diagrammatic sketch, showing the position of the apparatus used in measuring the dilatation time of the pupil. *A* is the cinematographic camera; *B*, the eye; *C*, the interrupting wheel, belt driven; *D*, the projecting sector of cardboard; *E*, the electric motor, and *F*, the arc lamp with a condensing lens system and interposed water filter for cooling.

of the wheel had carried it past the illuminating beam. Thus a sector, 2.94 cm. in width at the periphery, put the eye in darkness for 0.0625 second (fig. 2).

The experiments were always conducted on young blond persons, for it was found that dark irides did not photograph sufficiently clearly to permit of sharp differentiation of the pupillary border. The subject was seated comfortably and the apparatus adjusted. All lights were turned out, and three minutes for dark adaptation allowed. The camera was then started, following which the arc lamp was turned on. The film thus exposed recorded the contraction time of the pupil. The interrupting wheel was started, and the illuminating beam was interrupted by the smallest interrupting sector. Then the camera was stopped. The last part of the film recorded the contracted pupil, the length of time the eye was not illuminated and the pupillary size immediately after the eye was again illuminated. The small sector was replaced by the next larger, and the entire process was repeated. So by increasing the size of the interrupting sector in each experiment, the size of the pupil after the varying interruptions of illumination was recorded. Each film was then projected on a wallscreen, frame by frame, and the diameter of the pupil in each picture was measured.

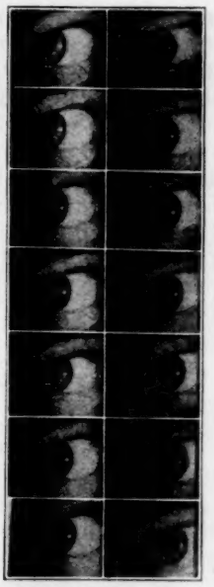


Fig. 3.—A composite unretouched photograph showing the rate of dilatation in one person.

The accompanying table gives the measurements recorded in twelve cases as well as the average. The figures represent the increase in the diameter of the pupil over the diameter in the measurement before the light stimulus was removed. Various factors of movement on the part of the patient, sputtering of the arc, etc., influenced the number of exposures in each case.

Figure 3 is a composite photograph showing the rate of dilatation in one person. Each picture shows the diameter of the pupil after an increasingly long interruption of the illuminating beam.

Figure 4 is based on the averages of a fairly large number of experiments. The diameter of the pupil in millimeters is shown on the ordinates and the elapsed time in ten thousandths of a second in the abscissas. The eye was illuminated exactly one second, as represented by the line labeled "light." In this graph can be seen the latent period of contraction, the primary contraction, the secondary contraction and the dilatation on removal of the light. It will be noted that there is no constant latent period of dilatation as there is of contraction. The dilatation proceeds at the rate of 0.95 mm. per second. Contrast this with the primary contraction rate of 5.48 mm. per second.

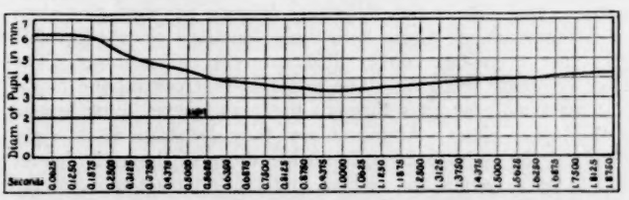


Fig. 4.—A composite graph based on averages. The diameter of the pupil in millimeters is shown in the ordinates and the elapsed time in ten thousandths of a second in the abscissas. The time the eye was illuminated is shown by the straight line labeled "light."

So much for the purely physiologic facts of the rapidity of contraction and dilatation of the normal pupil in young persons in light of high intensity. This method of investigation does not permit of the use of weaker light or of colored light, and is limited to

*Measurements in a Series of Experiments on the Dilatation Time of the Pupil**

Seconds	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Av.
0.0625	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.04	0.01
0.1250	0.14	0.05	0.10	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
0.1875	0.14	0.00	0.20	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.05	0.09	0.06
0.2500	0.15	0.04	0.26	0.00	0.21	0.18	0.09	0.15	0.00	0.00	0.00	0.04	0.10
0.3125	0.13	0.04	0.31	0.14	0.05	0.18	0.04	0.15	0.14	0.20	0.14	0.24	0.15
0.3750	0.05	0.19	0.31	0.06	0.07	0.22	0.14	0.15	0.19	0.20	0.14	0.29	0.17
0.4375	0.09	0.38	0.31	0.28	0.04	0.36	....	0.20	0.43	0.15	0.29	0.53	0.28
0.5000	....	0.43	0.62	0.28	0.07	0.45	....	0.20	0.53	0.40	0.43	0.63	0.41
0.5625	....	0.31	0.41	0.28	0.25	0.54	....	0.30	0.48	0.90	0.58	0.59	0.47
0.6350	....	0.57	0.77	....	0.25	0.51	....	0.40	0.58	0.70	0.87	0.63	0.59
0.6875	....	0.75	0.82	....	0.33	0.47	....	0.70	0.53	0.90	0.72	0.77	0.68
0.7500	....	0.67	0.82	....	0.48	0.66	....	0.80	0.67	1.00	0.87	0.77	0.75
0.8125	....	0.96	0.57	....	0.87	0.62	....	....	0.63	1.10	0.67	0.82	0.78
0.8750	....	0.76	1.00	....	0.80	0.85	....	....	0.58	1.00	0.87	0.58	0.80
0.9375	....	0.96	0.81	....	0.80	0.76	....	....	0.91	1.15	0.87	....	0.90
1.0000	....	0.97	0.72	....	0.86	0.74	....	....	0.97	....	0.82	....	0.85
1.0625	....	....	0.96	....	1.08	....	....	....	....	....	....	....	1.02

* Each pupillary measurement represents the increase in diameter of the pupil over the diameter in the measurement before the light stimulus was removed.

people with blue or light-colored irides. Therefore, sweeping conclusions cannot be drawn from these figures.

In examining carefully the individual measurements recorded in the table, it would seem that in one half of the experiments there is a suggestion of a latent period of approximately the same duration as the latent period of contraction. Owing to the infinitesimal changes, it is not possible to plot a curve that demonstrates the suggested latent period. However, attention is called to the entirely different character of contraction and dilatation curves. In the former there is a sudden jump to maximum contraction rate, whereas in the dilatation curve there is a uniform rate with no sharp transition points. These data tend to corroborate the unproved statement that dilatation of the pupil is due to tonicity of iris tissue alone and not to muscular action of the dilatator pupillae.

CONCLUSIONS

In normal young blue-eyed persons, the pupil reacts in accordance with the following terms:

(*a*) On illuminating the eye, there is a latent period of 0.1875 second.

(*b*) This is followed by a primary contraction of the pupil lasting 0.4365 second at the rate of 5.48 mm. per second.

(*c*) Then there comes a secondary contraction of the pupil lasting 0.3125 second at the rate of 1.34 mm. per second.

(d) When the illumination is removed, the pupil starts to dilate at the rate of 0.95 mm. per second.

ABSTRACT OF DISCUSSION

DR. CHARLES A. BAHN, New Orleans: Light rays on entering the eye have a velocity of approximately 186,000 miles a second, which is about their rate on striking the retina. In the external layers of the retina these light rays are transformed into several types of nervous energy. One is developed in the production of sight, and another in starting the pupillary reaction arc. It is not definitely known whether the same cellular mechanism serves both these functions or whether different nerve endings convey different types of impulses. The latter is highly probable. The impulses that control the pupillary reactions now pass through the optic nerve, some believe in the larger fibers. At the chiasm they decussate as do sight impulses, the right tract transmitting those of the right halves of both optic nerves and retinas, and the left tract those of the left half. The pupillary impulses pass through the optic tracts to the outer geniculate bodies, finally reaching the nucleus of the third nerve and ending the centripetal pathway. Here there is also a definite interchange of impulses between the two sides. The centrifugal fibers now begin conveying impulses along the third nerve, entering the orbit and passing to the ciliary ganglion through the short ciliary branches. The short ciliary nerves, on reaching the posterior pole, enter the sclera and pass outside the choroid to the ciliary body. They then enter the iris and finally reach the sphincter of the iris. The author has shown that the time required for nerve impulses to make this circuit is 0.1875 second. The primary contraction period now ensues, 0.4365 second, at the rate of 5.48 mm. a second. After the pupillary impulses reach the outer geniculate body, part of them possibly branch off, these going to the fifth nerve nucleus. After passing down the spinal cord to the ciliospinal center they emerge by the rami communicantes through the seventh and eighth cervical as well as the first and second thoracic branches. After passing along the carotid artery and entering the gasserian ganglion, these impulses pass to the first division of the fifth nerve and then along its short ciliary branches, entering the sclera at the posterior pole, finally reaching the iris.

DR. EDWARD B. HECKEL, Pittsburgh: I simply want to record an observation I have made: that the pupil is capable of reaction to light stimuli that are not sufficient to show the effect on the pupil itself. I made this observation some years ago, looking at a film fifty feet away from me. On twisting the eye one gets a circular disk, and by closing one eye there is dilatation and by opening one eye there is contraction.

DR. HARRY S. GRADLE, Chicago: The measurements that we have presented do not offer absolute proof, but they tend to confirm the expressed theory that the dilatation of the normal pupil on removal of light is not a muscular action but is due rather to the tonus of the iris tissue. If it were a muscular action (contraction of the dilator fibers of the iris) there would be a latent period as there is in contraction of any muscle elsewhere in the body. The absence of the latent period in a majority of our experiments leads us to believe that the dilatation of the pupil on elimination of light is due purely and simply to iris tissue tonus and not to muscular contraction of the dilator fibers of the iris.

CHRONIC GASTRIC ULCER IN CHILDREN

REPORT OF A CASE

J. C. FOSHEE, M.D.
GRAND RAPIDS, MICH.

Chronic gastric ulcer in children is of interest because of its rarity. Each case recognized should be reported to add to the few cases on record, in order that the profession may profit from a collective study. A thorough search of the literature to date reveals but eighteen cases reported. There have been published only three articles that have dealt exclusively with chronic gastric ulcer as related to children. Two of these articles have been published by foreign clinics. The articles are case reports. An exclusive study of chronic gastric ulcer in children has not been made heretofore. In three instances isolated cases have been reported, or mentioned, concurrently with articles dealing with duodenal ulcer in children.

Loeber,[1] in 1909, stated that the condition was extremely rare and one that was frequently overlooked unless accompanied by an active hematemesis. Thevenard,[2] in 1922, reporting on duodenal ulcer in a child, stated that chronic calloused ulcer, either of the stomach or of the duodenum, was rare in children under 14 years of age and that barely ten authentic observations were on record in the literature. Since that time numerous articles on duodenal ulcer in children, both acute and chronic cases, have been published. Since chronic gastric ulcer is the subject of this paper, only those ulcers pertaining to the stomach will be considered. Weber,[3] in 1925, reported two cases from his clinic in Germany and stated that the occurrence, which was the first that he had seen, was in keeping with the increase which he had recently noticed in adults, the cause of which he attributed to poor living conditions and bad food. Proctor,[4] in his report in 1925, made a thorough and comprehensive study of chronic peptic ulcer in children. He compiled all the cases which were known and reported up to that time. Nineteen of these involved the stomach and duodenum,

From the Surgical Section at Butterworth Hospital.

1. Loeber, Maud: Gastric Ulcer in a Girl Three Years Old, Arch. Pediat. **46**: 578-583 (Sept.) 1909.
2. Thevenard, M.: Ulcer of the Second Portion of the Duodenum in a Child of Eleven Years, Paris chir. **14**: 590-596, 1922.
3. Weber, M.: Cases of Ulcer of the Stomach in Childhood, Arch. f. klin. Chir. **137**: 731-734, 1925.
4. Proctor, O. S.: Chronic Peptic Ulcer in Children, Surg., Gynec. & Obst. **41**: 63-69 (July) 1925.

eleven of which were confined to the stomach as definite chronic ulcers. He added to these one case of his own, thus making twelve cases in children of 14 years of age or under known to literature at that time. Proctor stated that his case—that of a boy, aged 14 years, with chronic gastric ulcer in the pyloric end of the stomach—was the only one of gastric ulcer in a child observed at the Mayo Clinic from 1906 to 1924, out of a total of 1,596 cases of chronic gastric ulcer. He emphasized that the condition was so rare that most cases which had been reported were found at autopsy; a small number were discovered at operation, and a smaller number were diagnosed clinically. Paus,[5] in 1926, reporting two cases of gastric ulcer in children, stated that most data reported were derived from autopsies. Mention is made in the majority of the textbooks that primary gastric ulcer may occur as a manifestation of hemorrhagic disease of the new-born, acute fevers and the acute infectious diseases of the very young, but that in early childhood it is a very uncommon occurrence. Nixon and Fraser,[6] in 1928, reported one case of chronic gastric ulcer in a child in their series, from the Royal Infirmary of Bristol. They stated that gastric ulcer in children was more common than usually supposed.

A study of the known chronic gastric ulcers in children does not reveal that the majority were first discovered at autopsy. I hope to show that the majority of cases in children are diagnosed at operation. It may be premature to declare, but nevertheless I shall hope to show that not any case coming to operation which has been correctly diagnosed has any need for autopsy.

Since Proctor did not confine his work to chronic ulcer of the stomach, I am reporting all cases to date, including the twelve cases in Proctor's summary, six additional cases which I have compiled from the literature, and one of my own, which makes a total of nineteen cases. I have accepted the standard laid down by Proctor, Paus and others that cases should be confined to those in children 14 years of age or under; that the symptoms must be of two months' duration or longer, and that sufficient pathologic change, in the way of induration, fibrosis and callous formation, must exist to constitute actual chronicity.

The following are the cases reported in the literature to date. The first eleven were cited by Proctor in his analysis made in 1925 and the twelfth is his own case reported at that time:

REPORT OF CASES IN THE LITERATURE

CASE 1 (Rufz, 1843).—A girl, aged 13, had symptoms for two years, at the end of which time perforation and death occurred. Ulcer was found on the lesser curvature of the stomach at autopsy.

CASE 2 (Verliac, 1865).—A boy, aged 14, had digestive disturbances for two years. During the month before he died, the symptoms were very severe. Necropsy revealed a perforating gastric ulcer.

CASE 3 (Bechtold, 1904).—A girl, aged 5, had symptoms for five months and then acute peritonitis developed. Drainage for appendicitis was followed by death. At necropsy the perforation of an ulcer on the greater curvature of the stomach was found.

CASE 4 (Robinson, 1905).—A boy, aged 14, died after one year of illness. Multiple ulcerations of the stomach were found.

CASE 5 (Lund, 1909).—A boy, aged 8, had symptoms for one year. Operation disclosed a large gastric ulcer, adherent to the liver. The boy recovered.

CASE 6 (von Cackovicz, 1912).—A boy, aged 14, had symptoms for seven years. At operation a fixed stenosis of the pylorus was found. The boy recovered.

CASE 7 (von Cackovicz, 1912).—A girl, aged 13, had symptoms for two years. Operation revealed a stenosis of the pylorus, with scarring. The patient recovered.

CASE 8 (Theile, 1919).—A girl, aged 13, had symptoms for about four months, at the end of which time perforation occurred. Operation was performed for supposed appendicitis. Perforation was found on the anterior wall of the stomach near the lesser curvature. The patient recovered.

CASE 9 (Sanjek, 1920).—A girl, aged 12, had symptoms for more than a year. At operation, pyloric stenosis from gastric ulcers was found. The patient recovered.

CASE 10 (Carro, 1922).—A girl, aged 8, after having had symptoms for two years, was operated on for pyloric ulcer. She recovered.

CASE 11 (Norrlin, 1923).—A girl, aged 7, had symptoms for three years, when sudden severe pain with peritonitis occurred. Operation revealed a large calloused ulcer of the pylorus with perforation. The child recovered.

CASE 12 (Oscar S. Proctor, from the Mayo Clinic series, 1923).—A boy, aged 14, whose mother had had duodenal ulcer, had jaundice at 11 years of age and had never been strong and rugged. He had suffered acute attacks of pain in the abdomen off and on since 8 years of age. In more recent years he had suffered a typical ulcer pain. A diagnosis was made clinically and by x-rays. Operation for chronic penetrating ulcer of the lesser curvature near the pylorus was done. The patient made an uneventful recovery.

CASE 13 (Loeber, 1909).—A girl, aged 3, had a chronic gastric ulcer of the deeply penetrating type, with an accessory pocket high on the lesser curvature just below the entrance to the esophagus, and a large six hour gastric retention. A diagnosis was made and the condition was demonstrated clearly by x-rays. It was activated into acute exacerbation by an acute nasopharyngeal infection. The child made an uneventful recovery with a modified Sippy management.

CASE 14 (Weber, 1925, case 1).—A boy, aged 15, had had ulcer symptoms for five years. The symptoms were violent and almost continuous for the past two years. Operation disclosed the scar of a large fibrous ulcer, which had healed, on the posterior surface of the stomach near the greater curvature, and an active, large, diffuse, infiltrating ulcer with a crater on the lesser curvature near the pylorus, involving more than one half of the circumference of the stomach. Inability to deliver the stomach and transverse colon because of adhesions necessitated an anterior gastrojejunostomy. Uneventful recovery took place. The case may well be included among those in patients of 14 years or under, since the child had been acutely ill with almost continuous ulcer symptoms since he was 10 years of age.

CASE 15 (Weber, 1925, case 2).—A boy, aged 12 years, had symptoms of four years' duration, with a prepyloric ulcer on the lesser curvature, with indentation and partial pyloric occlusion. Posterior gastro-enterostomy was performed, with an uneventful recovery.

CASE 16 (Paus, 1926, case 1).—A boy, aged 14 years, had ulcer symptoms "as long as he could remember," at least ten years or more. A large calloused ulcer was found in the pyloric end of the stomach, with tumor-like infiltration of the gastric wall, extending onto the duodenum, onto the liver and into the pancreas. Severe bleeding occurred. Operation by a posterior gastro-enterostomy was done, with recovery.

CASE 17 (Paus, 1926, case 2).—A boy, aged 9 years, had had ulcer symptoms for three years. A large calloused ulcer of the pylorus on the lesser curvature was found. The ulcer had perforated through the posterior gastric wall and had penetrated into the pancreas. Operation by partial gastric resection with anterior anastomosis to the jejunum was done, with uneventful recovery.

5. Paus, Nikolai: Two Cases of Gastric Ulcer in Children, Acta chir. Scandinav. **61**: 40-43, 1926.

6. Nixon, J. A., and Fraser, A. D.: Peptic Ulcer in the New-Born, Arch. Dis. Childhood **3**: 157-162 (June) 1928.

CASE 18 (Nixon and Fraser, 1928).—A girl, aged 3 months, had gas pain and vomiting of two months' duration. Melena of recent development was present. The child lived two weeks under observation. Postmortem showed a deep, single ulcer with a bleeding vessel on the posterior surface of the cardiac orifice of the stomach. The edges of the ulcer were terraced and the surrounding wall was fibrotic and thickened.

REPORT OF AUTHOR'S CASE

Edward L., aged 13 years, admitted to my care at Butterworth Hospital, June 20, 1929, was suffering from acute epigastric pain of two weeks' duration. The pain radiated down the right side, into the right lower quadrant, and was accompanied by nausea and vomiting. The vomiting had occurred several times a day since the onset of the attack and consisted of a yellow fluid without any trace of blood. The bowels were obstinately constipated. The stools were of normal color. The pain was increased by solid food, and liquids were poorly tolerated. The mother thought the patient had been somewhat relieved by alkaline powders which she had administered.

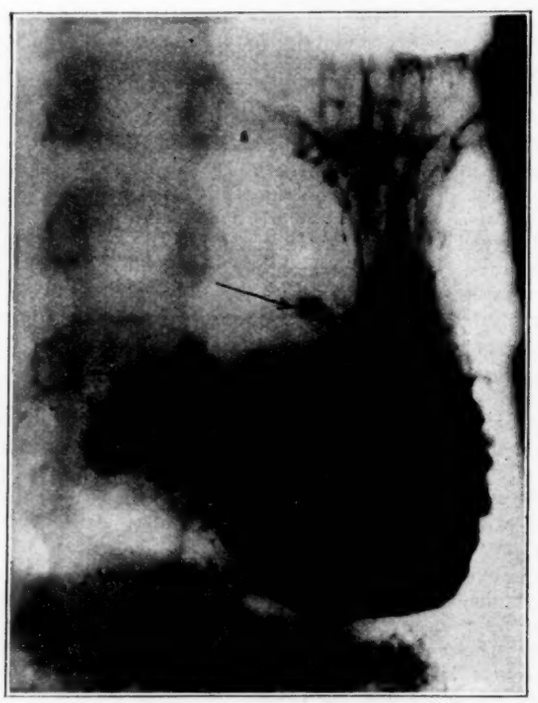


Fig. 1.—Perforating gastric ulcer on the lesser curvature near the cardia.

The child had undergone operation for a left mastoid infection while convalescing from scarlet fever at 7 years of age. The mastoid wound healed after a rather prolonged drainage. The right ear began to discharge pus soon afterward and has continued to discharge up to the present time. The patient has had from fifteen to twenty attacks of gastric disturbance similar to the present illness, over a period of five years. The attacks usually occurred in the spring and fall and kept the child in bed from two to four weeks at a time. During the intervals he was quite free from distress. A tonsillectomy was performed at the age of 12 years. The child was breast fed. The mother stated that following the scarlet fever he had never regained his normal weight and that his gastric distress started during the following year.

At examination the child was found to be poorly nourished and small for his age. The skin was cold and clammy. The patient was markedly dehydrated. There was a purulent discharge from the right ear with a perforated drum, but no tenderness over the mastoid. The left mastoid showed a well healed scar and the ear had normal hearing. The tonsils and adenoids had been removed. The upper part of the abdomen was flat and retracted, of the scaphoid type, with prominent costal arches. The lower abdomen was slightly bulging, flaccid and relaxed, with the exception of the right lower quadrant, which was somewhat rigid and tender. The upper part of the abdomen was quite rigid, with a definite localized area of tenderness on deep pressure 2½ inches above the umbilicus in the midline. Urine, blood Wassermann and tuberculin tests were negative, as was the stool examination. The leukocyte count was 10,400, with polymorphonuclears 85 per cent. The temperature was 99.4 F. and the pulse rate 110.

An acute lesion of the stomach or duodenum was suspected. The patient was referred to the x-ray department for gastric study. Roentgenograms of the stomach revealed a perforating gastric ulcer, with a well defined accessory pocket on the posterior surface of the cardia near the lesser curvature (fig. 1). There was no deformity of the duodenal bulb and no six hour residue.

The patient was prepared for operation by the administration of fluids subcutaneously and intravenously, with as much food by mouth as tolerated for nine days. Operation, June 29, revealed a large perforating crater ulcer about 2 cm. in diameter on the lesser curvature near the cardia, involving both the anterior and the posterior surface but perforating through the posterior surface. The area of induration, fibrosis and callous formation around the ulcer was 6 cm. in diameter. The penetration was into the liver and lesser peritoneal sac. The ulcer was excised with the cautery, and the stomach edges were approximated with two layers of catgut and one layer of silk. No omentum was available to cover the suture line. A posterior gastrojejunostomy was made, which concluded the operation.

The patient made an uneventful recovery and was discharged from the hospital on the fourteenth day. He was placed on a careful dietary regimen and at the end of three months had gained 15 pounds (6.8 Kg.). The patient was observed every three months for the first year and at the end of the second year. At no time has he shown a recurrence of symptoms. A roentgenogram taken six months after operation showed a well functioning gastro-enterostomy and a perfectly smooth gastric wall at the site of the removal of the large lesion (fig 2). Roentgen study two years later showed similar conditions.

ETIOLOGY

The cause of chronic gastric ulcer in children is probably no different than in adults. Infection, the ulcer constitution, family predisposition and the child's susceptibility, together with malnutrition and improper food, play the most important rôle. Thevenard mentioned hepatic insufficiency as an important predisposing cause. A history of more than their share of infectious diseases is quite common in these cases. Undoubtedly the ulcers are first acute, following infection, and later become chronic.

Nickel and Hufford,[7] in 1928, reported on their study of a large series of peptic ulcers. They produced convincing evidence that chronic foci of infection, which harbored and disseminated Streptococcus viridans, with selective affinity for the gastric and duodenal mucosa, was frequently the primary factor in the production of ulcer.

PATHOLOGY

One is impressed by the extent of pathologic changes found in the stomachs of these little children. The crater and the surrounding area of induration are as large as in adults. Perforation is common, having occurred in thirteen cases of this series. Five cases showed pyloric obstruction of varying degrees. Tumor-like formation was common, and callous formation was present in six of the patients who had been operated on. As to the location, the common site was the lesser curvature, where the ulcer was found in twelve cases. Eight times it was at the pylorus and three times at the cardia. The posterior surface was involved in six

7. Nickel, A. C., and Hufford, A. R.: Elective Localization of Streptococci Isolated from Cases of Peptic Ulcer, Arch. Int. Med. **41**: 210-230 (Feb.) 1928.

instances, the anterior surface in one and the greater curvature in one. In two cases the ulcer appeared multiple.

SYMPTOMATOLOGY

The symptoms are not as clear-cut as in an adult because of the child's inability to relate them intelligently. However, reports from the family show that pain, vomiting and obstinate constipation are the most common symptoms. Vomiting is more frequent and pronounced in children than in adults. Hemorrhage is not common; it occurred in four cases. Pain has been more severe on the whole than in adults, which may be accounted for by the frequency of perforation and penetration. The pain was of such a character that three cases were mistaken for appendicitis, in two of which operation was done. The duration of symptoms was from two months to ten years, except in one case—that of Loeber—which had apparently been symptom free before the acute excerbation in the midst of an acute nasopharyngeal infection. However, roentgen examination leaves no doubt as to the long standing of this penetrating ulcer. The youngest patient was 3 months of age, and the oldest 15 years when operated on, although the latter patient had been bedridden with a penetrating ulcer for two years. The average age was 10 years.

DIAGNOSIS

It has been stated that the diagnosis in little children is extremely difficult and often is rendered only after the onset of hemorrhage and perforation. It has been the opinion of the majority of men reporting on the disease that most diagnoses were made at autopsy. I believe that, in a child from 8 to 14 years of age, the diagnosis may be readily made by careful analysis of the symptoms and physical observations and a complete roentgen study. A frail, slender and poorly nourished child with a periodic recurring gastric disturbance, accompanied by vomiting and constipation, should be assumed to have a gastric ulcer. Hematemesis and melena are valuable diagnostic aids.

TREATMENT

Medical treatment, when applicable to an ulcer case, is to be recommended. Uncomplicated ulcer in children yields to medical treatment better than in adults. Furthermore, I am prone to believe that children do not bear surgery as well as adults. This assumption may not be entirely justified, for in the extensively involved ulcer case of Paus, in which he did a partial gastric resection, the child recovered splendidly. Recovery seems to be the rule in every operative case, correctly diagnosed. It is doubtful whether medical treatment will produce marked benefit in the calloused, penetrating, perforating and obstructing ulcers. Therefore, patients suffering from this type of ulcer are suitable subjects for surgery. Gastro-enterostomy combined with local excision of the ulcer is the ideal surgical procedure. Local excision of the ulcer is best accomplished by the cautery, which is possible in nearly every case. The advantages of this method are that it lessens hemorrhage, saves time and is less likely to be followed by a recurrence of the ulcer at the original site. The cautery is also useful to ream out the penetrating areas of ulcer tissue in the adjacent structures and is apparently followed by union of the suture line by first intention in all cases. Of course, at a later date, all foci of infection should be removed and a proper dietary regimen instituted. A careful follow up should be carried out for two years or more.

CONCLUSIONS

1. Chronic gastric ulcer in children is more common than has been supposed, although it still remains noteworthy for its rarity of recognition.

2. Undoubtedly, in the future, more cases will be recognized and reported if these children are given the same careful examination and investigation that is given to adults.

3. The cause is as indefinite as it is in adults. Infection in children plays the most important rôle. The ulcer constitution in some cases stands out paramount, for in them it begins with their early infancy, before infection has become a factor. Influencing factors, such as alcohol, tobacco, overwork and nervous tension, play no part in the cause of ulcers in children as they may in adults.

4. The pathologic changes are quite extensive and as massive as those found in adults. Penetration and perforation are almost the rule, with the invasion of the adjacent organs.

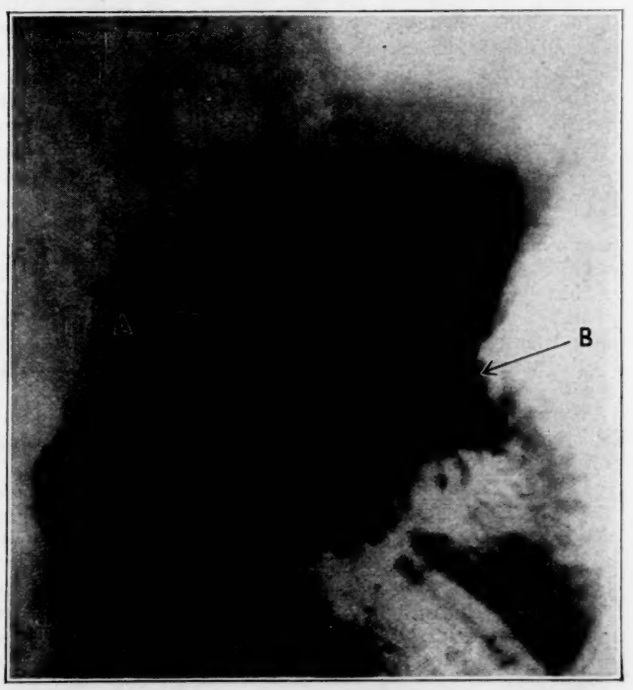


Fig. 2.—Appearance six months after operation: *A*, site of the previous ulcer; *B*, stroma of a posterior gastro-enterostomy.

5. Symptoms that are quite pronounced and typical of ulcer may go a considerable time unrecognized until the patient suffers hemorrhage or perforation.

6. Fourteen of the nineteen patients recovered, thirteen of whom were operated on. One patient recovered under medical management. One of the five patients who died was operated on, but the case was not recognized, since it was mistaken for a peritonitis from acute appendicitis, but autopsy revealed a perforative ulcer on the lesser curvature and a normal appendix. The four remaining cases were discovered at autopsy.

7. Posterior gastro-enterostomy was performed in twelve cases and a partial gastric resection with anterior anastomosis in one; all were successful, and those patients have not shown recurrences of either gastric or marginal ulcers.

508 Medical Arts Building.

Clinical Notes, Suggestions and New Instruments

NEGATIVE OCCULT BLOOD TESTS IN CARRIERS OF THE DYSENTERY-PRODUCING ENDAMOEBA HISTOLYTICA

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Opinion as to whether or not the presence of Endamoeba histolytica, the dysentery-producing ameba, in the human bowel is necessarily associated with invasion of tissue varies with different investigators. Thus, extreme views in favor of such an hypothesis were expressed by Dobell and O'Connor [1] in 1921 when they stated that "infection with this parasite [i. e., E. histolytica] must always produce a more or less pathological condition of the colon." Acton and Knowles [2] believed that "mild ulceration of the colon mucosa" takes place in the carrier condition. According to Boyers, Kofoid and Swezey,[3] "a constant search has been made for a true carrier, but as yet only one individual has been found by the medical author in more than 500 cases who showed no visible tissue damage attributable to E. dysenteriae." Craig,[4] in 1926, stated that "Endamoeba histolytica is a true tissue parasite living upon the tissues of its host. . . . It therefore follows that there can be no infection with this parasite without the production of pathological lesions, however minute such lesions may be. . . . It may be stated that there is no evidence that this species of ameba can exist in the intestine of man without producing lesions and that all individuals who show cysts in their stools must have lesions in the intestine."

On the other hand, James and Deeks [5] believe that "it [i. e., E. histolytica] takes on pathogenicity only when it invades the tissues which is by no means a constant happening." James,[6] in a later publication, held that "histolytica can live normally in the lumen of the upper part of the large bowel, and invades the tissues only under certain conditions."

Wenyon [7] and Thomson and Robertson [8] discuss the possibility of E. histolytica existing within the lumen of the intestine in a harmless commensal relation.

Evidence for believing that E. histolytica always invades tissue consists of the facts that (1) the food inclusions of the vegetative forms of E. histolytica found in the stools of individuals suffering from amebic dysentery are ordinarily composed of tissue elements (mostly erythrocytes) of the host, and (2) a multiplicity of mild symptoms, such as habitual constipation with one or more attacks of diarrhea at rare intervals, lack of appetite, loss of weight, uneasiness and indefinite neuralgic pains in the lower part of the abdomen, doubtful degrees of anemia, and symptoms of a neurasthenic type, are alleged to occur in more than 50 per cent of so-called carriers,[9] that is, cyst-passing individuals.

Evidence for believing that E. histolytica may exist as a lumen-dweller without invading tissue is based on the finding of a significant proportion of carriers in which there are no present symptoms and there is no history of past symptoms which might be due to the presence of E. histolytica. Such individuals have been termed contact carriers by Walker and Sellards.[10] James [6] maintained that if the tremendous number of cysts and precystic forms which are found in the stools of some carriers were generated within bowel tissue, extensive tissue invasion and ulceration with corresponding symptoms would inevitably occur. As no such processes are apparent, he assumes that the parasites may live within the lumen of the intestine.

The success of Boeck and Drbohlav [11] in obtaining cultures of E. histolytica not only in vitro but also in a medium free from blood cells or serum (Locke-egg-albumin) has indicated beyond doubt that the organism in vitro is not dependent on tissue elements for food. The same investigators showed that the food inclusions of E. histolytica contain bacteria. Subsequent investigation has confirmed these observations and has added to them the fact that the cultivation of amebas in vitro is facilitated by the presence of starch or flour (Dobell and Laidlaw,[12] Craig,[13] Tanabe and Chiba,[14] Cleveland and Sanders,[15]) which is freely ingested by the amebas.

The cultivation of E. histolytica in mediums containing neither blood cells nor serum, and the ingestion of bacteria and starch demonstrate that outside the body of its host the organism is capable of growth and multiplication under the conditions of life of a commensal rather than of an obligatory tissue parasite. Whether or not E. histolytica can similarly exist as a non-tissue-invading commensal within the bowel of man is, as has been pointed out, not definitely known and for the present is a question of opinion.

PROBLEM AND METHODS

The observations here recorded represent an attempt to determine the frequencies of the presence and of the absence of blood, as indicated by the benzidine test for occult blood, in the bowel contents of carriers of E. histolytica. If all the amebas reside within bowel tissue, bleeding must result in a high proportion of the cases; if the amebas are exclusively lumen-dwellers,[16] no bleeding would necessarily result from their presence, and, other causes of bleeding being ruled out, negative occult blood tests should be obtained; if, as James [6] suggests, in cyst dispensers amebas may be found at times only within the lumen, and at other times in both bowel tissue and lumen, occult blood tests might be either positive or negative, depending on whether or not tissue was being invaded at the time the test was made.

Owing to the fact that positive tests for occult blood may be obtained when the individuals examined have bleeding gums, hemorrhoids, and the like, no conclusions have been based on positive reports. The object of this investigation has been to see whether or not it was possible to obtain negative tests from any significantly large proportion of healthy cyst-dispensers.

The test was conducted in the usual routine manner. A smear of feces on a slide was covered with fresh benzidine-acetic acid-hydrogen peroxide mixture. Final determinations of color changes were made in from two to three minutes thereafter. This reaction depends on the presence of peroxidases which break up the hydrogen peroxide into water and free oxygen. The free oxygen oxidizes the benzidine, producing a compound with a blue coloration. As the reaction may be caused by the peroxidases of meat or fish, the individuals examined ate neither meat nor fish for three days. Occult

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blood tests were made daily during and after the meat and fish free diet.

In order to eliminate the possibility of blood being present and, therefore, detectable in only a portion of the stool, tests were made with a number of samples from various parts of the specimen. As a matter of fact, in every instance it was noted that the reaction was uniformly positive or negative throughout the specimen.

RESULTS

The results are indicated in the accompanying table. Briefly summarized, this table shows that (1) of thirteen "symptomless carriers"[17] of E. histolytica (eleven of whom had simultaneous infections with other protozoa), twelve were apparently free from any bleeding process within the intestine; (2) of eleven individuals harboring protozoa other than E. histolytica, eight gave negative occult blood reports; (3) the proportion of individuals positive for occult blood was at least as high in the group in which E. histolytica did not occur as in the group positive for the organism; (4) only two of the nine cases of Giardia lamblia (believed by some authorities to be pathogenic on occasion) were positive for occult blood, and (5) the single case of Trichomonas was negative.

Reports of Occult Blood Tests on Human Carriers of Intestinal Protozoa *

Organisms Found †	Occult Blood Test: Cases Positive	Occult Blood Test: Cases Negative
A. Carriers of Endamoeba histolytica		
E. histolytica	..	2
E. histolytica, Endamoeba coli	..	2
E. histolytica, Iodamoeba williamsi	..	1
E. histolytica, E. coli, I. williamsi	..	1
E. histolytica, E. coli, Endolimax nana	..	1
(E. histolytica), E. coli, E. nana	..	1
E. histolytica, E. coli, I. williamsi, E. nana	..	1
(E. histolytica, E. coli), E. nana, Giardia lamblia	..	1
E. histolytica, I. williamsi, E. nana, G. lamblia	1	..
E. histolytica, E. coli, I. williamsi, E. nana, G. lamblia	..	2
Total	1	12
B. Carriers of other intestinal protozoa only		
E. coli, E. nana	1	..
(E. coli, G. lamblia)	..	1
(E. coli, E. nana), Dientamoeba fragilis	..	1
E. coli, E. nana, D. fragilis	..	1
I. williamsi, G. lamblia	..	1
E. nana	1	1
E. nana, G. lamblia	..	1
Trichomonas hominis	..	1
G. lamblia	1	..
(G. lamblia)	..	1
Total	3	8

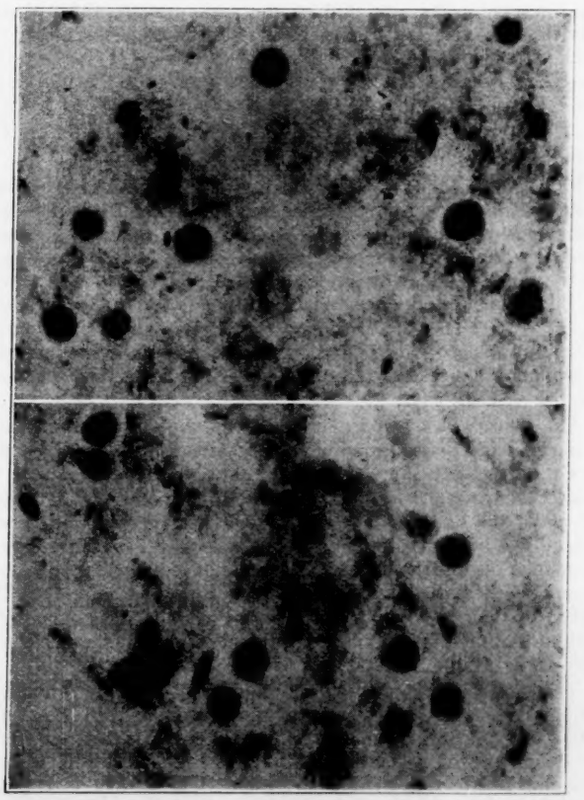
* Individuals are reported as giving a "negative" test for occult blood if the stools became negative during or on the day following the three day meat and fish free diet.

† Names of organisms enclosed by parentheses refer to the fact that these organisms were not found in the specimens while the individual examined was on his meat and fish free diet. In every instance, however, the organisms indicated were found within the week previous to or subsequent to the diet and were probably present, though not detected, while the occult blood tests were being made.

COMMENT

In evaluating these data, it is necessary to know the sensitivity of the test in order to compute the minimum quantity of blood detectable in the feces by the method employed. One cubic centimeter amounts of various dilutions of blood up to 1:100,000 were added to 9 cc. of samples of feces which were negative for occult blood, and these mixtures were tested by the benzidine reaction. A faint but perceptible coloration was obtained in the specimen consisting of 1 cc. of 1:10,000 blood and 9 cc. of feces. In all other specimens containing less blood, no color change could be observed. It therefore appears that, in our hands, the benzidine reaction will recognize the presence of blood in a dilution up to 1:100,000. This seems to be a modest figure, as the sensitivity of the benzidine test is stated to be up to 1:500,000 by some observers.[18] The average normal daily output of feces for a healthy male varies from 110 to 170 Gm. according to Hawk and Bergeim[19] and from 100 to 200 Gm. according to Cammidge.[20] Calculated on the basis of the latter figures, as their range includes the former, the total quantity of blood per day necessary to make a dilution of one part blood in 100,000 parts of from 100 to 200 Gm. of feces would be from 1 to 2 cubic millimeters.[21] If the rate of blood flow from invaded bowel surfaces was uniform, it might therefore be as low as from 0.041 to 0.083 cubic millimeters per hour to be detectable.

While such a minute degree of hemorrhage or even less might conceivably occur as a result of amebic tissue invasion, it is difficult to believe that the correspondingly minute amebic colonizations within the tissue could begin to account for the number of cysts produced in some of the carrier infections that were investigated. The individuals examined presented infections, in terms of cysts discharged, of widely varying magnitudes. In some cases, cysts were few in number, difficult to find and present in detectable numbers, as determined by simple smears, not more than once or twice a week. A fair proportion of the carriers discharged stools in which cysts were so numerous that they could be found in the first microscopic field of the preparation every day. Such an instance is illustrated in the accompanying photomicrographs of oil-immersion fields, magnified 470 times, of an unconcentrated smear of feces from one of our carriers. Such an individual must eliminate billions of cysts of Endamoeba histolytica every day, and as each cyst represents an encysted trophozoite, the number of active, feeding amebas present in the intestine each day must be at least



Two different microscopic fields of a smear of unconcentrated feces, stained with Heidenhain's iron hemotoxylin, from one of the authors' more heavily infected carriers. These particular fields were selected only because of their clarity and equal focus. They are entirely representative, as far as numbers of cysts are concerned, of the entire smear. The pictures were taken with a Leica camera, 8× Periplan ocular, and a 2 mm. apochromatic objective through Wratten filters B 58 and E 22, the total magnification being 470 diameters.

17. Carriers, i. e., cyst-dispensers, which were "symptomless" in that they were free from dysentery and diarrhea.

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21. The average specific gravities of blood (from 1.045 to 1.075, Hawk and Bergeim) and of feces (from 1.045 to 1.083, Cammidge) are approximately the same.

as great as the numbers of cysts discharged. Yet this individual gave no evidence of blood in the feces. Two other carriers in whom cysts were nearly as numerous were negative for occult blood on two separate occasions each, one of them remaining negative for six consecutive days on an extended meat and fish free diet. In the light of such evidence it is necessary to believe either that the parasites were not tissue-inhabiting amebas or that these billions of organisms were expelled daily from the bowel tissue without loss of more than from 1 to 2 cubic millimeters of blood.

We make no claim that the data here produced argue against the existence of symptoms due to the presence of amebas in E. histolytica carriers. It is quite conceivable that symptoms might develop from the absorption of toxic substances either elaborated by the living amebas or liberated from the bodies of dead amebas which have lived exclusively within the lumen of the intestine.

CONCLUSION

On the basis of the evidence here presented, it seems unlikely that E. histolytica is, as has been claimed, an obligatory tissue parasite. That it can and does survive within the lumen of the intestine seems indicated by the high proportion of amebic carriers whose stools give negative tests for occult blood.

INFLUENZAL MENINGITIS WITH RECOVERY

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Influenzal meningitis is by no means a rare disease. Influenzal meningitis with recovery, however, is a decidedly rare phenomenon, only twenty-five instances having been reported to date. My purpose in the present communication is to place on record another of these exceptional cases.

REPORT OF CASE

L. S., a man, aged 29, a furrier, entered the Beth Israel Hospital, Jan. 16, 1932, complaining of headaches and dizziness for the past six days.

The family, past and personal history was of no significance.

Seven days before admission the patient had had a painful tooth on the left side of the jaw extracted. A day later he noticed sharp pains in his right ear, which persisted for a day. At about the same time he was troubled by dizziness and headache. The headache, which was localized in the occipital region, continued up to the time of his admission to the hospital. For four days the patient attempted bravely to remain at work. The day preceding admission, however, he vomited and during the course of that day he vomited several more times. He therefore came to the hospital for relief.

The physical examination on admission disclosed that the patient was acutely ill, with a temperature of 101 F. and a pulse of 100. His throat was markedly congested and there was evidence of a postnasal drip. There was a soft systolic murmur heard over the aortic region. The patient stated that he had been informed of the presence of a cardiac murmur some four years previously when he applied for insurance. The blood pressure was 160 systolic and 94 diastolic. He also presented generalized hyperreflexia and definite nuchal rigidity, but the Kernig sign was bilaterally negative.

A spinal tap performed on the same day yielded cloudy fluid, under 330 mm. of water pressure. There were 2,660 cells, mostly of the polymorphonuclear variety. Albumin was 4 plus. Benedict's solution was not reduced. A smear from the cerebrospinal fluid proved negative. Cultures of some of the fluid were taken on appropriate mediums containing blood. The white blood count showed 12,600 cells, of which 83 per cent were of the polymorphonuclear and 17 per cent of the mononuclear type. A blood culture failed to demonstrate any organism.

With the possibility of a meningococcus meningitis in mind, antimeningococcus serum was administered, intravenously and intraspinally.

The day after admission the temperature rose to 104 and the patient experienced a chill. The nuchal rigidity became more pronounced. A bilateral Kernig sign was present. Cranial nerve involvement in the form of bilateral external rectus muscle palsy had set in. Spinal tap again yielded a cloudy fluid under increased pressure. Antimeningococcus therapy was continued.

A day later the temperature had risen to 105.5 and the patient suffered another chill. The white blood cell count at this time was 9,200, with 84 per cent polymorphonuclears. Neural examination showed meningeal signs, diminution of abdominal reflexes, double external rectus weakness and slight blurring of the nasal margin of both disks.

The otologist detected some reddening of the membrana tympani in both ears, but there were no signs of bulging of the drums. There was a fibrinous deposit on the tonsils and on the posterior pharyngeal wall. Because of the low white blood cell count, the suggestion of an influenzal meningitis was ventured.

The specimen of cerebrospinal fluid obtained at this time was cloudy and tinged with blood. It remained tinged with blood for the next three months, indicating a hemorrhagic process in the meninges. There were 1,600 white blood cells present. Benedict's solution was again not reduced.

On the following day the white blood cell count stood at 15,800, with 92 per cent polymorphonuclear cells. Clinically, two new features presented themselves: a herpes labialis, and severe pains over the sacrococcygeal region. The latter was the first indication of an irritative process affecting the lower roots of the spinal cord, a process that advanced steadily and resulted in a most troublesome sequel of the disease—a radiculitis.

Four days after a culture of the first specimen of cerebrospinal fluid had been made, the Pfeiffer bacillus was detected. On eighteen subsequent occasions, the same organism was recovered from cultures of the cerebrospinal fluid. The diagnosis, therefore, was established beyond doubt.

For about two weeks the patient appeared severely prostrated. The temperature persisted at 103.5. The pulse and respiration rates were increased. There was considerable wasting of the tissues. The meningeal signs had not diminished. For short periods a cloudy, delirious state had supervened. Essentially nothing more in the way of therapy than liberal tapping of cerebrospinal fluid was offered the patient during this trying time.

On February 6, three weeks after his admission, an almost critical change for the better occurred. The temperature fell to 100. Mentally, the patient appeared brighter. Meningeal signs were on the wane. Simultaneously with the clinical improvement, dextrose appeared for the first time in the cerebrospinal fluid; a few days later, culture of the fluid proved sterile. As mentioned before, however, one feature in the neurologic picture failed to participate in the general improvement. The radicular pains did not remit but, instead, spread now from the sacral area down both lower limbs.

A neural status, February 16, showed tenderness over the sacral region and over the posterior aspect of the left lower limb, weakness of that limb, a diminished achilles reflex on the left side, slight blurring of the nasal margins of the disks, mild bilateral external rectus muscle palsy, slight nuchal rigidity, and Kernig signs.

A roentgen examination of the spine was made to rule out a metastatic purulent focus as the possible cause of the radicular syndrome. This proved negative, however.

Reexamination, April 28, disclosed persistence of the pains over the sacral area and down the left lower limb, tenderness over the course of both greater sciatic nerves, more marked on the left side, the Lasegue sign bilaterally positive, the achilles reflex absent on the left side, the patellar reflex diminished on the left side, diminution in perception of pain and touch over the fifth lumbar dermatome on the left side, diminution in temperature sensation over the third lumbar to the first sacral dermatomes on both sides, and impairment of vibratory sense in both feet. In other words, the radicular syndrome had become more pronounced, probably because of organization of the exudate over the roots.

The patient was discharged from the hospital, June 10, 1932. His convalescence at home was uneventful until July 9, when, fully a month later, there abruptly developed a full-fledged meningeal syndrome, accompanied by a rise in temperature to 101. Lumbar puncture at this time disclosed a turbid fluid

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containing 1,200 cells, 80 per cent polymorphonuclear in type. The patient was immediately hospitalized. To the gratification of his medical attendants, the fulminating signs subsided rapidly and within a week the patient was as well as he had been previous to this episode. Culture of the cerebrospinal fluid, it should be mentioned, proved sterile. At the present time, two months following this attack, the patient remains well. He is free from pain. His sensory disturbances are minimal. Only the disturbances in the deep reflexes of the lower limbs persist.

Worthy of note also is the persistence of a tachycardia, from 106 to 118 beats per minute, up to the present time.

COMMENT

Frequency of Influenzal Meningitis.—As stated at the outset, influenzal meningitis, while by no means common, cannot be termed a rare disease. Neal,[1] in a study of 1,523 cases of meningitis in New York City during the years 1910 to 1924, found 662 to be of the tuberculous, 625 of the meningococcus, 86 of the pneumococcus, 83 of the streptococcus, and 51 of the influenzal group. Influenzal meningitis, in other words, was the fourth most common of the purulent meningitides. Since Slawyk in 1897 made the first clinical diagnosis of the condition, 302 cases have been collected from the literature.[2] When one adds to these the cases in which the diagnosis had not been made and, equally important, the cases which, while correctly diagnosed, did not find their way into the literature, the actual number of cases becomes appreciably greater. Holt[3] stated that he used to observe two or three cases every year.

What lends additional interest to the present case is the fact that the patient was an adult. Meningitis in general is a disease of infancy and childhood, the tuberculous type occurring most commonly in the second year of life and the purulent types occurring most frequently in the first year of life.[1] In influenzal meningitis this relative sparing of adults seems even more striking. Thus, in Neal's series of fifty-one cases, not one of the patients was above 20 years of age. This explains, incidentally, why most of the contributions to the subject come from pediatricians.

Frequency of Recovery.—Statistics bearing on this phase of the subject are apt to be misleading if taken at their face value. Rivers,[4] in a series of 220 cases, found 17 recoveries, a mortality rate of 92.25 per cent. Bloom,[2] in a more extended series of 302 cases, reported 24 recoveries, a mortality rate of 92.05 per cent. It is readily understood, however, that a case signalized by a favorable outcome is more apt to find its way into the literature than one with the customary lethal termination. The proportion of recoveries, therefore, looms larger than it actually is. More satisfactory from the statistical point of view are series of consecutive cases, reported without regard to type of outcome. In three such series, observed by Rivers,[4] Neal,[1] and Jenks and Radbill,[5] there were two recoveries in eighty-seven cases, yielding a mortality rate of 97.7 per cent.

The prognosis appears definitely better in adults than in young patients. In Rivers' group of seventeen recoveries, three were in adults: one recovery, reported by Cohoe, was in a patient 33 years old; the second, reported by Klinger, in a patient 26 years old; the third, reported by Spillman and Beneck, in a patient "of advanced age." The proportion of cases with recovery is relatively higher in adults. Further evidence pointing to the same conclusion is afforded by Rivers, who states that although 152 of the 220 cases were in children less than 2 years of age, 12 of the 17 recoveries occurred in individuals 2 years of age and over.

Etiology and Mode of Invasion.—The general consensus among authorities on the subject now is that the organism detected in cases of influenzal meningitis is the same type of organism as that originally described by Pfeiffer, and that minor variations in reaction are due to the existence of numerous strains. Anderson and Schultz have isolated five different strains. Valentine and Cooper isolated ten strains. As many as seventy-three miscellaneous strains appear to have been recognized.[6]

Neal[7] is most emphatic in her belief that influenzal meningitis is not at all related to epidemic influenza and points out that the epidemic of 1918 produced no increase in the number of cases of influenzal meningitis. In fact, only one such case was observed. Rivers reports a similar experience.

Considerable controversy has revolved around the question whether or not influenzal meningitis may occur as a primary disease. It was originally held that in every instance a primary focus existed elsewhere in the body, be it in the ears, sinuses or lungs. Pisek[8] stated that "the presence of the organism in the cerebrospinal system with symptoms pointing to involvement of the respiratory system, nasopharynx, or accessory sinuses of the middle ear, stamp the disease as metastatic in character." Numerous other observers share this view. Evidence is not lacking, however, to indicate that influenzal meningitis may exist as a primary disease entity, if not in all cases, at least in a large number. Of the thirty-two cases surveyed by Jenks and Radbill,[5] eight had no ascertainable antecedent cause. Of the thirty-two cases studied by Neal up to 1921, in only eight was a primary focus of infection present. In a consideration of 171 cases, Rivers decided that the process was primary in the meninges in 127. Of 71 that came to autopsy, 29 failed to show any source of the infection elsewhere in the body.

Pathology and Symptomatology.—The discussion of these topics may properly be omitted, since the observations do not differ materially from those observed in other forms of purulent meningitis.

Treatment.—Wollstein prepared an anti-influenzal serum which is reported to have acted beneficially on monkeys artificially subjected to influenzal meningitis. In human beings, serum therapy has not yielded encouraging results. Frequent spinal drainage is indicated for palliative and, possibly, curative effects.

71 East Seventy-Seventh Street.

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THROMBOSIS OF THE LEFT EXTERNAL ILIAC ARTERY SECONDARY TO A LEFT OVARIAN CYST

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Assistant Surgeon, Service A, Lankenau Hospital

A woman, aged 65, was brought to the Lankenau Hospital, July 26, 1931, suffering from a painful swelling of the left leg of three days' duration. About two years before this she had dropped a screen on the dorsum of the left foot, and a wound resulted that healed in about one week. Soon after this an ulcer developed on the medial surface of the left ankle, which had been treated from time to time by elevation of the extremity and dressings of magnesium sulphate. The ulcer never healed and was present and active on admission. Along with the ulcer occurred swelling of both legs, for which the patient had been wearing elastic bandages. She also gave a history of varicose veins of the left leg of four or five years' standing.

July 23, three days before admission, she was awakened at night with severe pain in the left foot extending up to the knee, and marked swelling of the entire extremity below the knee, requiring rest in bed until she was brought to the hospital.

Two days before admission a chilly sensation, which lasted all day, occurred, associated with headache, anorexia, marked thirst and restlessness. The pain subsided about twelve hours before admission, at which time a bluish tinge was noted on the toes of the left foot.

The past medical history was negative, except for scarlet fever in childhood, typhoid at 18 years of age, blood poisoning at 49 years of age, and at present slight dyspnea on exertion and nocturia twice. Her menstrual history was normal; she passed the menopause at 50 years of age without any untoward symptoms. She had had one normal pregnancy.

The patient, who was well developed and obese, was admitted with a temperature of 98.8 F., pulse 84, respirations 28, and blood pressure 140 systolic, 84 diastolic.

The physical examination was practically negative, except for the condition of the leg. The left leg and foot were of a light bluish gray, but only the calf of the leg was swollen. An ulcer about 2.5 cm. in diameter was noted on the medial surface of the ankle, surrounded by an indurated raised margin. The skin of the foot was wrinkled to just above the knee and was swollen, tense, and cold. There was no pitting edema. Questionable pulsation was palpable in the posterior tibial, as well as in the femoral, artery. There was no tenderness over the femoral vessels. Reflexes were normal and equal.

Laboratory tests of the urine showed that it was of amber color, cloudy, neutral, with a specific gravity of 1.020, presenting a trace of albumin, hyaline casts, phosphate crystals, and epithelial cells.

The red blood cells and the hemoglobin were within normal limits. The white blood cells numbered 10,300, with neutrophils, 76 per cent; lymphocytes, 16; large mononuclears, 7; transitionals, 1. Urea nitrogen was 48; blood sugar, 115. The Wassermann and Kahn reactions were negative.

The day after admission the lower half of the leg and the foot were purple and there was no pulsation anywhere in the extremity as high as the femoral vessels.

Believing this to be a case of thrombosis of the femoral artery, I opened the left thigh in the region of the femoral vessel, under local anesthesia with procaine hydrochloride, and exposed the left femoral artery, which proved to be hard and entirely without pulsation; a small clot was found above the branch of the profunda. The clot was removed. There being no bleeding from the proximal end of the vessel, a sterile oiled rubber catheter was passed up through the vessel for a distance of 11.5 cm.; at this point a very definite obstruction was encountered. An effort was made to dislodge this obstruction by pressing upward with the catheter, with the idea that the blood pressure would force the thrombus down to the opening in the femoral artery. The attempt was not successful, and not wishing to risk rupturing the vessel and injuring the pelvis, I closed the wound without attempting any further procedure because of the patient's poor condition.

On the first postoperative day the foot and leg continued to be purple and cold; the thigh was cold and dusky and there was a hardness along the canal of Hunter; the patient was very toxic. On the third day there was a definite extension of the gangrene, which was of the dry type, for a distance of about 8 cm. A venous ooze was seen coming from the old ulcer and along the tibia. The color of the foot gradually deepened; the patient became more and more toxic and gradually sank into a state of coma, with death ensuing on the fourth day after operation.

Autopsy revealed a left ovarian cyst, the size of a lemon, that was adherent to the sigmoid and had caused pressure on the external iliac vessels at the brim of the pelvis, at which point the external iliac artery was occluded by a thrombus about 2 cm. in length, while the entire lumen of the external iliac vein was filled with clotted blood. The right ovary was also cystic. Other more or less related conditions were an organizing infarct of the spleen, organizing thrombo-arteritis, senile arteriosclerosis, and fibrosis of the myocardium with miliary abscesses present.

A survey of the literature fails to reveal any reported cases of a similar nature. While it is not unusual for a thrombus, but usually of the vein, to result from pressure, as of the bladder or of an enlarged infected uterus, it is apparently rarely that pressure from an ovarian cyst leads to thrombosis of the external iliac artery.

Of course we all learn by our mistakes. In this case, although a pelvic examination was not made, it is possible that on account of the patient's obesity the small cyst of the ovary might not have been felt. Nevertheless, in the future I certainly would not omit making a vaginal examination in the presence of incipient gangrene of the leg. Furthermore, I feel that in a similar case in which an attempted embolectomy is not successful, one would be justified in making a pelvic exploration.

1914 Pine Street.

A SIMPLE TEST FOR PLASMA PROTEIN CONTENTS BELOW THE EDEMA-PRODUCING LEVEL

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New York

A type of edema called "hydremic" has long been recognized in which the blood plasma is abnormally dilute with regard to its protein content. Such edema is encountered in nephritis, diabetes and other conditions in which malnutrition leads to plasma protein deficit. That this type of edema is due to diminished plasma protein content and to the consequent diminution of the osmotic attraction of the blood for fluid from the tissue spaces is a conclusion based on numerous physiologic experiments and clinical observations.[1] Furthermore, in a study of the quantitative relationship between plasma protein deficit and the tendency to edema in nephritic patients, Moore and Van Slyke[2] found that a critical level of the plasma protein concentration exists above which there is usually no tendency toward the formation of edema and below which such tendency is regularly present. This critical level is about 5.3 per cent of total plasma protein and is accompanied by a specific gravity of approximately 1.023. Liu[3] found the same critical level in edema attributable to plasma protein deficit caused by malnutrition. In nephritis, diabetes and other conditions involving malnutrition, data showing whether the plasma protein content or specific gravity is above or below this critical level assist in deciding whether the tendency to edema and ascites of the "hydremic" type, from protein deficit, is present, and in differentiating this type of edema or ascites from types due to other causes. Of such other types, the edema of cardiac failure is probably the one most frequently requiring differentiation from "hydremic" edema.

For a simple test to determine whether the plasma specific gravity is above or below the critical level we have utilized the familiar principle of observing whether a drop of the plasma sinks or floats in another liquid of known specific gravity. We have obtained the desired specific gravity, viz., 1.0235 at 20 C. (water at 20 C. being taken as 1.000) by using monofluorobenzene,[4] or a mixture of one volume of xylene with 2.06 volumes of monochlorobenzene. The fluorobenzene has the advantage that the specific gravity of the pure substance at 20 C. is 1.0236. Consequently, preparation of a mixture is unnecessary, and evaporation of part of the liquid does not affect the density of the residue. The cost is rather high, however. The xylene-chlorobenzene mixture is cheap, and, if kept carefully enclosed in a glass-stoppered bottle, it does not undergo appreciable change from evaporation.

The xylene-chlorobenzene mixture can be tested by known solutions of specific gravity 1.0235. As such, one may use sodium chloride, 3.36 Gm. per hundred cubic centimeters. A drop let fall into the organic mixture, in the manner described, should float within the organic fluid and neither rise nor fall.

TEST PROCEDURE FOR PLASMA

The freshly drawn blood is mixed with heparin, 1 mg. per cubic centimeter of blood, or with oxalate, not more than 2 or 3 mg. per centimeter, and is centrifugated. The clear plasma is dropped from a pipet held about 2 cm. above the level of the fluorobenzene or xylene-chlorobenzene mixture. If the plasma specific gravity is below that of the fluid, the drop will rise rapidly to the surface, whereas if the drop has a higher specific gravity, it will fall rapidly to the bottom. Plasma just at the critical edema level will bob around if the tube is gently shaken, seemingly unable to decide whether to rise or fall. After a short time the drop flattens on the side or bottom of the tube and remains there as a record of its specific gravity.

Sixty-Sixth Street and York Avenue.

From the Hospital of the Rockefeller Institute for Medical Research.

1. This evidence, first applied clinically by Epstein, has been reviewed recently by Peters and Van Slyke: Quantitative Clinical Chemistry **1**: 682.

2. Moore, N. S., and Van Slyke, D. D.: The Relationships Between Plasma Specific Gravity, Plasma Protein Content and Edema in Nephritis, J. Clin. Investigation **8**: 337 (April) 1930.

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4. Fluorobenzene may be obtained from the Eastman Kodak Company, Rochester, N. Y.

Special Article

THE FUNDAMENTALS OF ELECTRO-CARDIOGRAPHIC INTERPRETATION

J. BAILEY CARTER, M.D.
CHICAGO

(Continued from page 1262)

AURICULAR EXTRASYSTOLES

Here the impulse arises from an ectopic focus, which may be anywhere in the auricles; it is not confined to these but spreads to the ventricles. The interval between the previous normal P wave and that of the premature beat is always less than the interval between normal beats and varies widely according to the degree of prematurity. The interval between the extrasystole

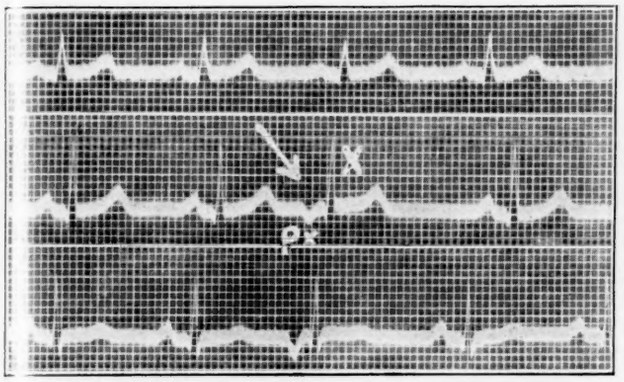

Fig. 40.—Auricular extrasystoles: A normal heart rhythm interrupted at *x* by a complete premature cardiac cycle. This beat presents a ventricular complex of normal outline, proving that it arose in a supraventricular focus. It is preceded by an auricular complex P*x*, which is inverted, indicating that the impulse initiating this premature beat arose in an abnormal auricular focus (away from the sinus node) and that the resulting wave followed an abnormal course in the auricle. Note the absence of a compensatory pause following auricular extrasystoles.

and the next normal beat following varies also, and at no time does the sum of the two equal the duration of two normal beats. Therefore, the pause that follows

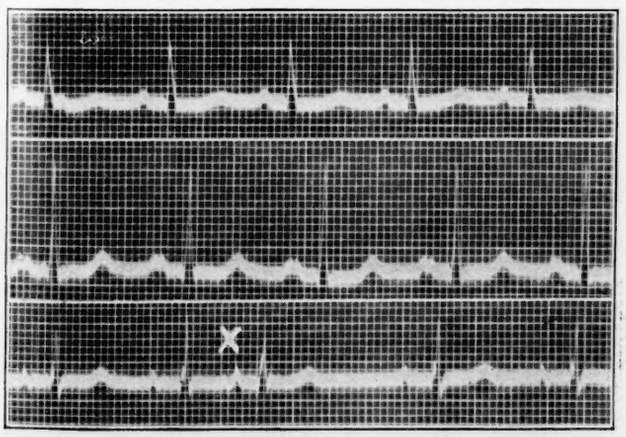

Fig. 41.—An auricular extrasystole at *x*, which arose within the sinus node, probably toward its tail. The P waves of the premature and rhythmic beats are similar but not identical in form. The Q-R-S complex is of supraventricular origin. Myocardial damage is evidenced by $P_{1,2}$ notched, Q-R-S_1 slurred, Q-R-S_3 notched, $T_{1,2,3}$ low voltage.

an auricular extrasystole is not compensatory; it is too short; the T-P interval is shortened, and hence the fundamental rhythm is disturbed.

The P wave is of abnormal contour, notched, splintered or inverted, owing to the abnormal path of the excitation wave in the auricles, which was generated in an ectopic (auricular) focus, at a distance from the pacemaker. If the ectopic focus is in or near the S-A node, the whole P-QRS-T complex is of normal or

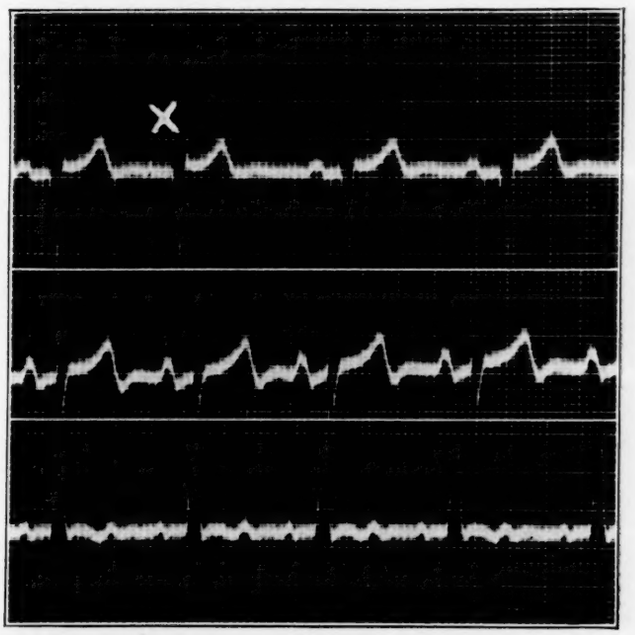

Fig. 42.—An auricular extrasystole at *x*, which probably arose at or near the edge of the sinus node. Note that the abnormal P wave here varies more in form from the normal P waves than in figure 41. Right axis deviation is present.

practically normal form and is identified only by its prematurity. If remote from the S-A node, the P wave is usually inverted. An auricular extrasystole may be so early that its P wave and the T wave of the pre-

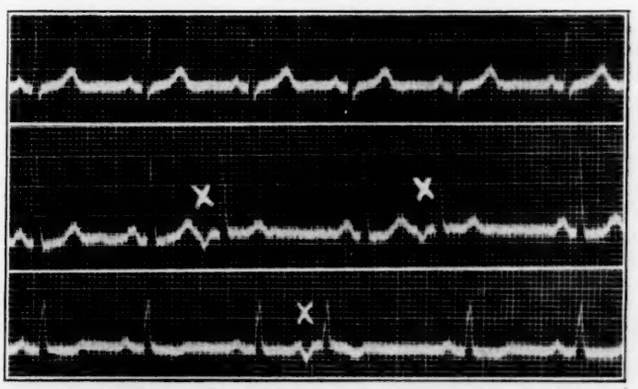

Fig. 43.—Auricular extrasystoles at *x*, which arose at a distance from the pacemaker. Abnormal P waves here are markedly different from the normal P waves. Myocardial damage is evidenced by Q-R-$S_{1,2}$ slurred, Q-R-S_3 notched.

ceding complex fall together and summate. Auricular extrasystoles may occur in succession, each premature P wave coinciding with a preceding T wave summit.

The Q-R-S complex is usually normal in all respects, since it is of supraventricular origin. It may be slightly anomalous or so markedly anomalous as to be mistaken for a beat of ventricular origin, as the result of deficient conduction through the junctional tissue. Such a complex is termed an aberrant Q-R-S complex (fig. 45).

About half the cases that show auricular extrasystoles also show varying abnormality of spread of the

excitation wave through the ventricles. Such auricular extrasystoles, with aberrant ventricular complexes associated, are practically always seen in hearts with demonstrable conduction defects. Usually the beat

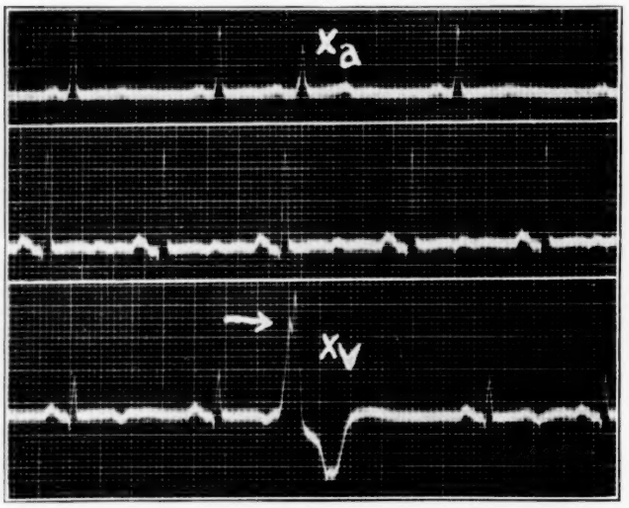

Fig. 44.—Simultaneous occurrence of auricular and ventricular extrasystoles at *Xa* and *Xv*. In the case of *Xv*, the P wave is seen notching the upstroke of the ventricular extrasystole. Myocardial damage is evidenced by Q-R-$S_{1, 3}$ slurred, T_2 diphasic, T_3 inverted.

immediately following an auricular extrasystole is from the pacemaker, the old heart rhythm being immediately restored. Rarely, this beat may also be of ectopic origin. There is a variation in type of auricular extrasystoles, depending on their site of origin. If the

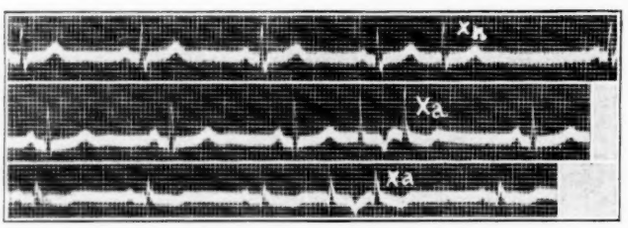

Fig. 45.—A-V nodal extrasystole (*x n*) arising from about the middle of the A-V node. Here the normal rhythm is interrupted by a premature ventricular complex, which is in itself nearly normal but is not preceded by a P wave. This extrasystole is followed by a compensatory pause. Auricular extrasystoles occur at *x a*, the P wave being buried in the T wave of the preceding complex. Here there is no compensatory pause. Note that the Q-R-S complexes here vary from those of the normal cycles (and *x n*), indicating abnormal conduction of the excitation process in the ventricles. These are examples of aberrant Q-R-S complexes following auricular extrasystoles. $P_{2, 3}$ notched. Q-R-S_3 notched. S T_3 negative. T_3 negative.

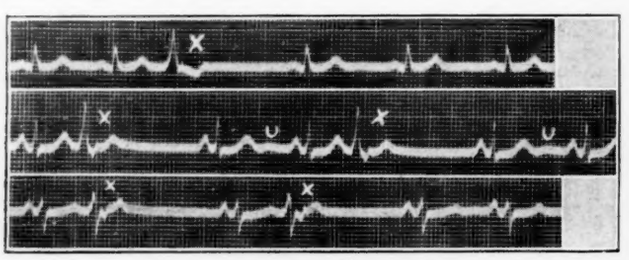

Fig. 46.—A-V nodal extrasystoles at *x* arising low down in the A-V node. The P waves occur during the S T interval of the abnormal beats. Note the aberrant form of the Q-R-S-T complex of these abnormal beats. Two U waves are indicated. Tendency to left axis deviation, Q-R-S_3 diphasic. Myocardial damage Q-R-$S_{1, 3}$ slurred, extrasystoles.

ectopic focus is in the S-A node (the pacemaker here is displaced from the head toward the tail of the node), the P wave is practically normal. If the impulse is of ectopic auricular origin, the P wave is notched or diphasic. If the ectopic focus is distant from the pacemaker the P wave is inverted, as previously stated. Auricular extrasystoles are not interpolated (figs. 40 to 44, 130, 141 and 142).

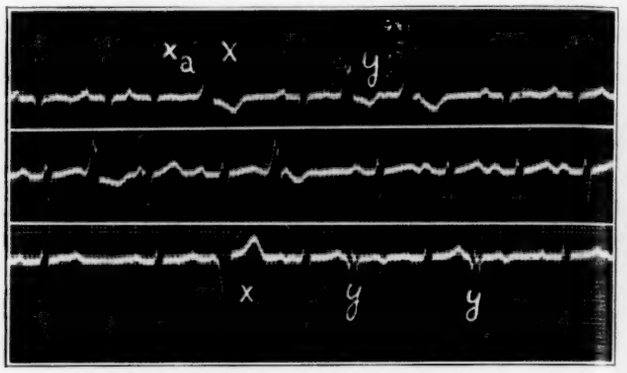

Fig. 47.—An electrocardiographic grab bag: 1. Left axis deviation, Q-R-S_3 inverted. 2. Delayed A-V conduction; P-R interval is 0.24 second. 3. Myocardial damage Q-R-S_2 slurred with 2, 4 and 5 present. 4. Left ventricular extrasystoles, multiple foci. Note that *x* and *y* types are different in contour; they originate from different foci in the left ventricle. 5. Auricular extrasystole (at *x a*).

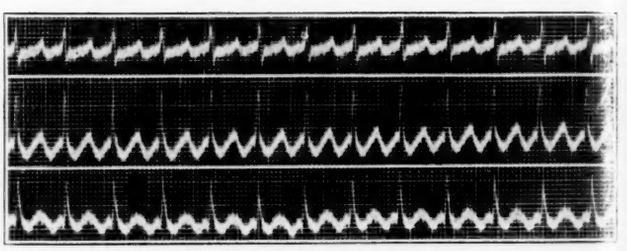

Fig. 48.—Auricular flutter with 2: f response of the ventricles. Only every other auricular contraction provokes a ventricular response. Auricular rate, 280. Ventricular rate, 140. The f waves follow each other in rapid succession. T waves and f waves are usually combined. Flutter waves occur with great regularity.

A-V NODAL EXTRASYSTOLES

If a normally shaped Q-R-S wave appears prematurely without deformity and is followed by a P wave, either inverted (retrograde) or upright (normal), it is said to be an A-V nodal (junctional) premature beat. If the premature Q-R-S complex is wider than normal or otherwise deformed, it originated from some ectopic focus in the ventricles and should be so considered. The pauses here are compensatory, the P-P intervals being equal. Therefore there is no disturbance of the

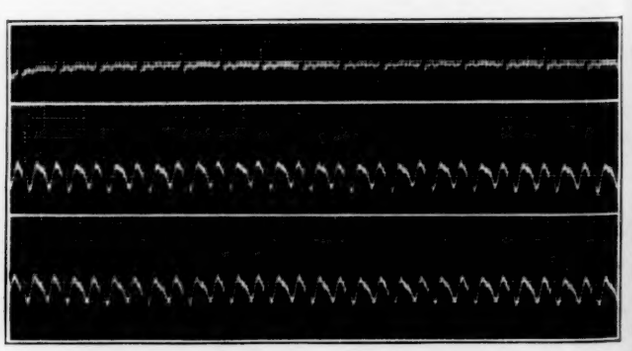

Fig. 49.—Auricular flutter: Auricular rate, 300 per minute. Ventricular rate, 150 per minute.

fundamental (auricular) rhythm. This proves that the extrasystole arose below the auricles. The Q-R-S complex has physiologic outlines; therefore it arose above the main branch of the bundle of His. The P-R inter-

val may be greatly reduced, as low as 0.04 second, because of the short course of the impulse to the ventricles. The auricles and ventricles may contract at the same time, if the focus is low in the junctional tissue. Here the P wave may appear to be absent or superimposed on the R wave. If the ectopic focus is very low in the junctional tissue, the P wave may fall on the descending limb of the Q-R-S complex, or just after its completion. Here the P wave is invariably inverted and the Q-R-S complex is often bizarre in contour (figs. 45 and 46).

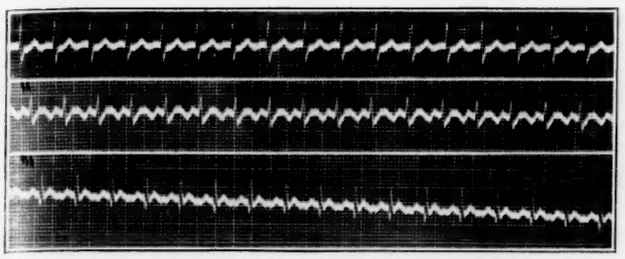

Fig. 50.—Auricular flutter: Auricular rate, 320 per minute. Ventricular rate, 160 per minute in lead 2. Auricular rate 300, ventricular rate 150 in leads 1 and 3.

AURICULAR FLUTTER

Auricular flutter is due to a circus movement within the auricular muscle continually following the same path at a constant rate. Flutter is more rarely encountered than fibrillation; it is more often transient than permanent. It is seldom, if ever, seen without clear-cut signs of organic heart disease. It is most frequently seen in mitral stenosis, especially if marked; in exophthalmic goiter, as paroxysmal flutter; and in hypertensive heart disease, in which it frequently alternates with fibrillation. The symptoms are those of auricular fibrillation plus heart failure, but there is a predominant rhythm even though the pulse is irregular. The auricular rate is regular at from 200 to 400 per minute, only a few of these impulses passing over and initiating a ventricular contraction. The ratio is usually 2:1, with a ventricular rate of from 120 to 170 per minute. Pure flutter exhibits great regularity of cycles. Impure flutter exhibits variations from cycle to cycle. The ventricular action here may be regular or irregular, rapid or slow, dependent on the grade of A-V block present. Usually it is found at first to be rapid and regular at one half the auricular rate, a 2:1 heart block being present. Flutter may be fairly permanent (months) or distinctly paroxysmal. Digitalis often increases the auricular rate in flutter; it tends to convert the condition into fibrillation. Digitalis practically always reduces the ventricular rate, by increasing the degree (grade) of A-V block present. That is,

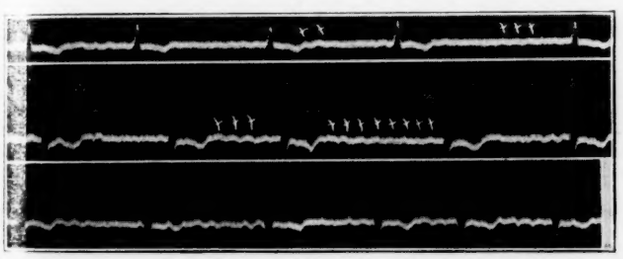

Fig. 51.—Auricular fibrillation: Rate, 50 per minute. The small wavelets marked *f* are due to auricular activity. Note how faint these f waves are in lead 1. The Q-R-S complexes occur irregularly and are not preceded by any wave of constant form which might represent a P wave. Note the evidence of myocardial damage. Note the digitalis type of T wave in leads 2 and 3 (no iso-electric S-T interval and the inverted T has the peculiar asymmetrical contour).

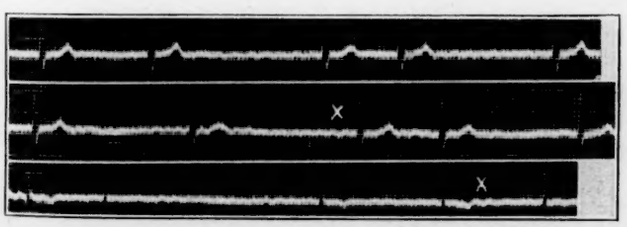

Fig. 52.—Auricular fibrillation: Rate, 50 per minute. P waves are replaced by continuous fine vibrations, evident as f waves at *x* but seen elsewhere as such with difficulty. Myocardial damage is evidenced by slurring of Q-R-S in all leads.

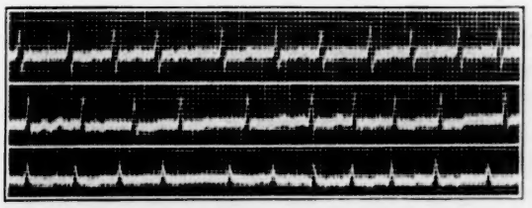

Fig. 53.—Auricular fibrillation: Rate, 160 per minute; f waves that are really difficult to see; myocardial damage, Q-R-S slurred in all leads; tendency to right axis deviation.

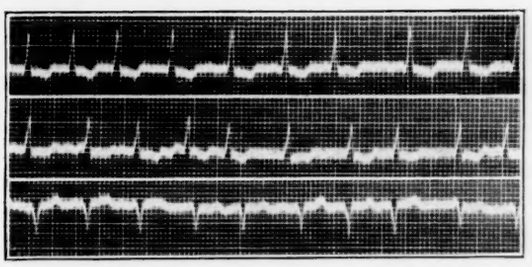

Fig. 54.—Auricular fibrillation: Rate, 140 per minute; f waves practically absent; myocardial damage, Q-R-S slurred in all leads, T low voltage in all leads; left axis deviation.

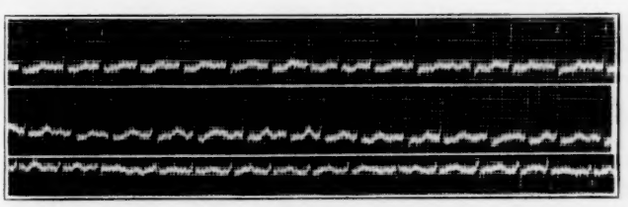

Fig. 55.—Auricular fibrillation, complicating thyrotoxicosis: Rate, 140 per minute. Note marked somatic muscle tremor. Left axis deviation.

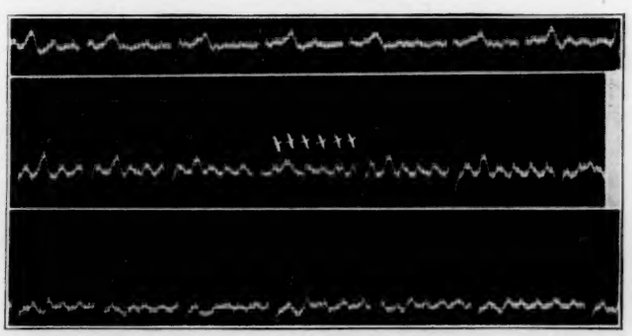

Fig. 56.—Auricular fibrillation, simulating an auricular flutter. Note that the f waves recur fairly regularly but Q-R-S complexes are of irregular occurrence.

it changes a 2:1 into a 4:1 rhythm. When the auricular rate is 300 and the ventricular rate is 150, this is changed to a rhythm in which the auricular rate is 300 and the ventricular rate is 75. After this, signs of decompensation rapidly clear.

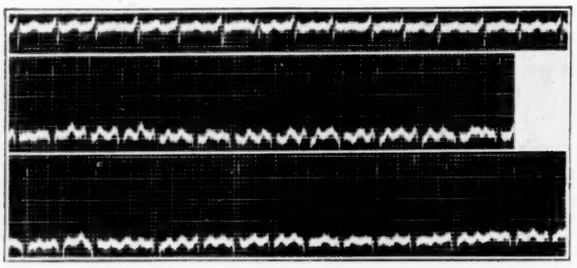

Fig. 57.—Auricular fibrillation (coarse): Impure flutter. Rate, 160-170 per minute. Right axis deviation.

After the pulse is slowed, the continued use of digitalis in smaller doses converts the flutter into fibrillation. After fibrillation is established, cessation of digitalis medication sometimes causes the reappearance of normal sinus rhythm, which may persist for years. Quinidine slows the auricular rate in flutter, as in fibrillation, and tends to abolish the condition altogether, owing mainly to the fact that it lengthens the refractory period of the auricular muscle and so stops the circus movement.

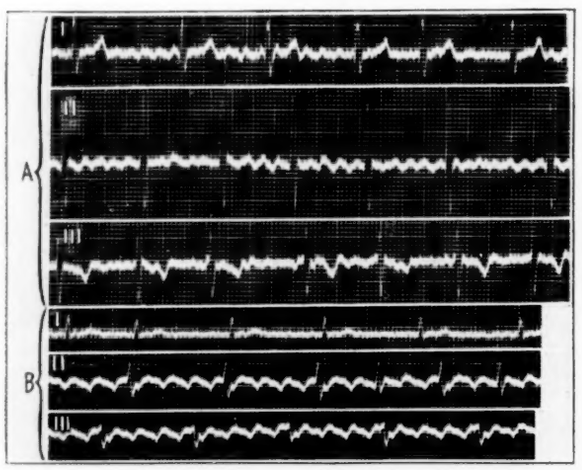

Fig. 58.—*A*, auricular fibrillation, impure flutter. *B*, auricular fibrillation, simulating an auricular flutter very closely. In lead 3 there is a clear-cut picture of flutter with a 3:1 ventricular response. Left axis deviation.

Fig. 59.—Auricular fibrillation with extrasystoles from a single focus in the right ventricle. This is an indication to lower dosage of digitalis, even if the rate is still above 80 here.

The partial A-V block is not due to disease of the junctional conduction system but to its inability to conduct the rapidly discharged auricular impulses. If the A-V block is complete, in the absence of digitalis action, it means disease of the junctional conduction system.

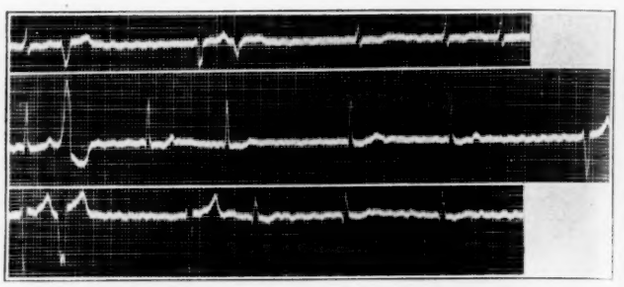

Fig. 60.—Auricular fibrillation with extrasystoles from multiple foci in both ventricles. The rate is 70 per minute. This is an indication to stop digitalis medication entirely.

If 1:1 flutter occurs, fainting attacks are common. In a case of flutter, application of pressure over the vagus in the neck usually causes a marked temporary slowing, after which the rhythm frequently becomes very irregular. This helps to differentiate the condition from paroxysmal tachycardia, in which vagal pressure either stops the attack completely or has no effect whatever.

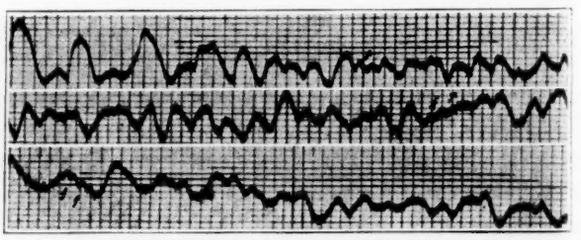

Fig. 61.—Ventricular fibrillation: The same sort of irregularly varying form is seen in this record as in the auricular waves of fibrillation of the auricles, but the waves are much larger and often bear a certain resemblance to ventricular extrasystoles. The small wavelets *f* are considered due to auricular fibrillation. This illustration is from Dr. Halsey's article on ventricular fibrillation. From "Clinical Aspects of the Electrocardiogram," Harold E. B. Pardee. Courtesy Paul B. Hoeber, Inc., New York.

The P waves are absent, being replaced by f waves (flutter waves), which follow each other in rapid succession, no iso-electric period, as a rule, being apparent.

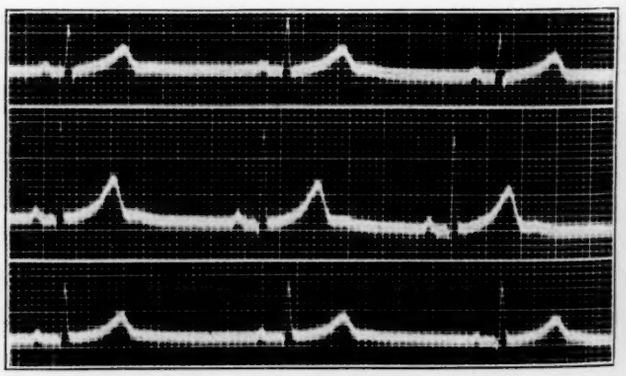

Fig. 62.—Normal sinus bradycardia: The rate is slow, but each cycle is normal.

Diastole of the auricle as a whole is lacking, the various muscle fibers resting individually. The f waves are remarkably constant in rate, form and amplitude, giving rise to a serrated graph in which each complex is a duplicate of the last. They are usually seen best in

leads 2 and 3. They may be positive or negative. The Q-R-S complex is of supraventricular (normal) form but is frequently distorted by f waves. T waves usually are not to be seen, since they are hidden by the alterations of the graph (figs. 48, 49, 50, 128 and 131).

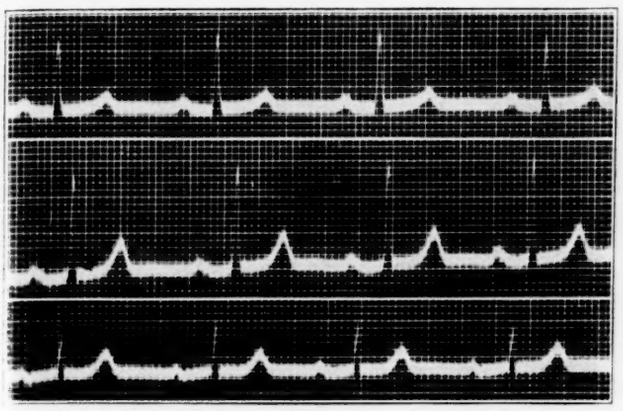

Fig. 63.—Prolonged A-V conduction: P-R interval, 0.21 second. Otherwise normal with P_1 notched, P_3 diphasic, Q-R-S_3 slurred.

AURICULAR FIBRILLATION

Auricular fibrillation is due to a circus movement within the auricular musculature traveling at a varying rate of speed and not following a constant path. It

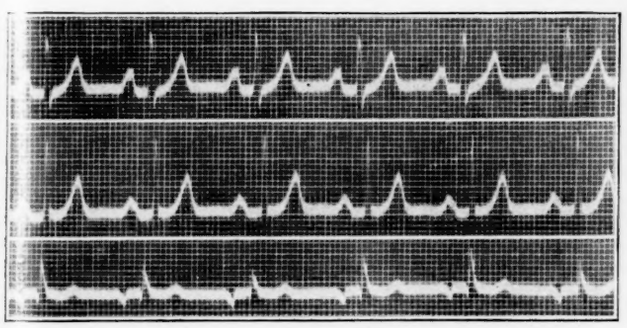

Fig. 64.—Prolonged A-V conduction: P-R interval, 0.21 second. Auricular hypertrophy. P_1 notched, P_3 inverted, Q-R-S_3 slurred.

originates about the mouth of the superior vena cava in the right auricle. The result of this circus movement is to maintain a series of small rapid fibrillary contrac-

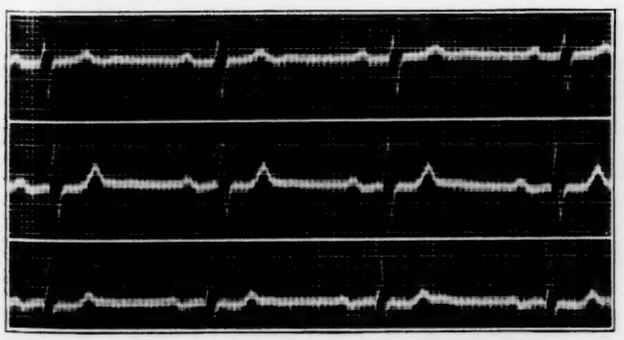

Fig. 65.—Prolonged A-V conduction: P-R interval, 0.26 second. Right axis deviation. Mild myocardial damage, Q-R-S slurred in all leads.

tions of the auricles, only a relatively small number of which are responded to by the ventricles. The result is a pulse which is usually rapid and extremely (irregularly) irregular both as to time and to force but may be quite slow and almost regular in some cases. Owing to the failure of some of the weak ventricular contractions to open the semilunar valves or to initiate a pulse wave in the aorta, the pulse rate at the wrist is often less than at the apex, the difference being known as the pulse deficit. Exercise increases both the rate and the

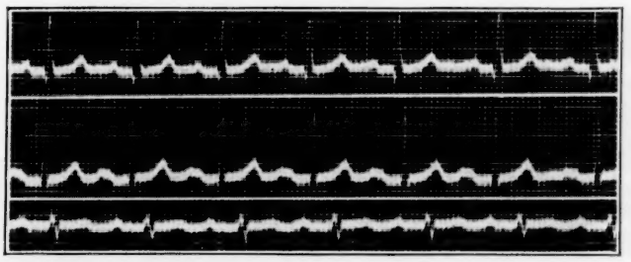

Fig. 66.—Prolonged A-V conduction: P-R interval, 0.25 second. Left axis deviation. Myocardial damage, Q-R-S_1 slurred, Q-R-S_3 notched.

irregularity of the contractions, whereas it frequently causes the disappearance of extrasystoles. Auricular fibrillation is of frequent occurrence in heart failure. It constitutes 50 per cent of the persistent arrhythmias.

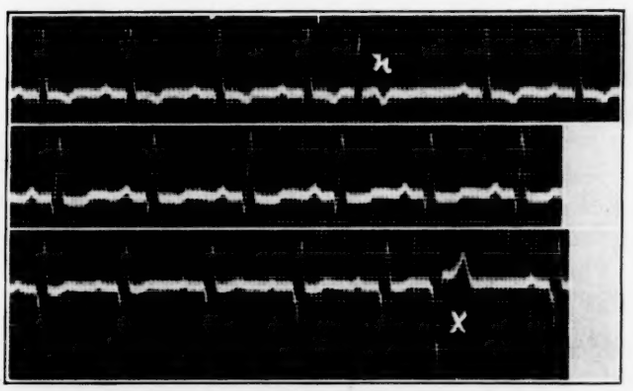

Fig. 67.—Prolonged A-V conduction: P-R interval, 0.22 second. Q-R-S interval 0.10 second in lead 1 and 0.12 second in leads 2 and 3. Rate, 80 per minute. Tendency to left axis deviation. Myocardial damage, Q-R-S slurred in all leads, Q-R-S_3 diphasic, notched. Left ventricular extrasystole from a single focus at *x*, with nodal extrasystole at *n*. Cessation of digitalis medication is indicated.

It is rarely seen in the absence of definite evidence of organic heart disease, but it does occur, occasionally, in individuals who have no valvular or myocardial disease. It is commonly observed in mitral stenosis,

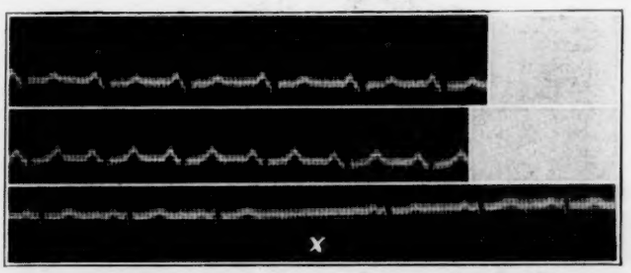

Fig. 68.—Sinus arrest, sometimes called S-A block or sino-auricular block, an irregularity in which the whole heart is involved: A long pause occurs during what is otherwise almost regular heart action. It is nearly, but not quite, twice the length of a short cycle. This irregularity may result from digitalis or occur in thyrotoxicosis, when the rate of the whole heart may be suddenly and almost exactly halved. Occasionally there is found in athletes a regular action of the whole heart at a rate of 34 to 40 per minute which becomes suddenly doubled on moderate exercise. S-A block is probably responsible for this type of bradycardia.

hypertension hearts, and thyrotoxicosis. It is rarely observed in aortic disease or in subacute bacterial endocarditis. The degree of cardiac insufficiency in

thyrotoxicosis is dependent on the duration rather than the intensity of the thyroid disturbance. Much larger doses of digitalis are frequently required here to obtain therapeutic results. Auricular fibrillation may be of paroxysmal (figs. 140 and 144) or permanent (chronic) type. When fibrillation occurs in heart failure, the arrhythmia merely alters to some extent the other preexisting symptoms.

As a rule, when fibrillation of the auricles occurs the ventricular action is rapid and absolutely irregular, but

The P waves are absent. They are replaced by f waves, which recur at a rate of from 400 to 600 per minute, usually about 450 per minute.

The Q-R-S complex is irregularly irregular in its recurrence and is of supraventricular type.

The T wave, if prominent, is deformed.

In thyrotoxicosis the effects of muscle tremor on the record may be confusing; they may appear to be f waves, and care is required in interpreting such graphs (fig. 55).

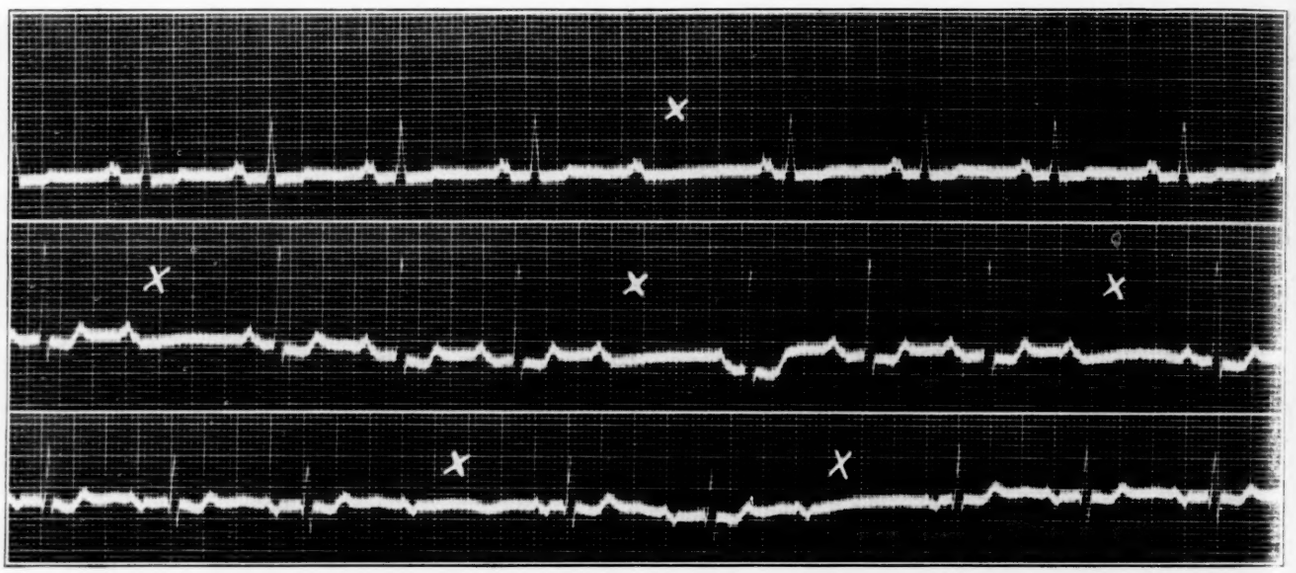

Fig. 69.—Incomplete heart block with dropped beats at *x*. Compare this with figure 68. Note that the P waves of the dropped beats are present here.

this is not always the case, since after digitalis therapy a pronounced slowing of the ventricles takes place and in rare instances perfect regularity may result, usually at a slow rate, approaching that of complete heart block (30 per minute). If the ventricular rate is less than 200, there is some degree of A-V block present. Usually digitalis causes only partial A-V block, giving a relatively high ventricular rate. When this rate

Fibrillation may be irregularly interrupted by premature ventricular contractions that result from impulses arising from different foci of irritability. If the patient is taking digitalis, it is an indication to decrease the dose (fig. 59). If these are of frequent occurrence or from multiple foci, the digitalis should be stopped entirely (fig. 60). If this is not done, overdosage of digitalis may lead to digitalis coupling, in

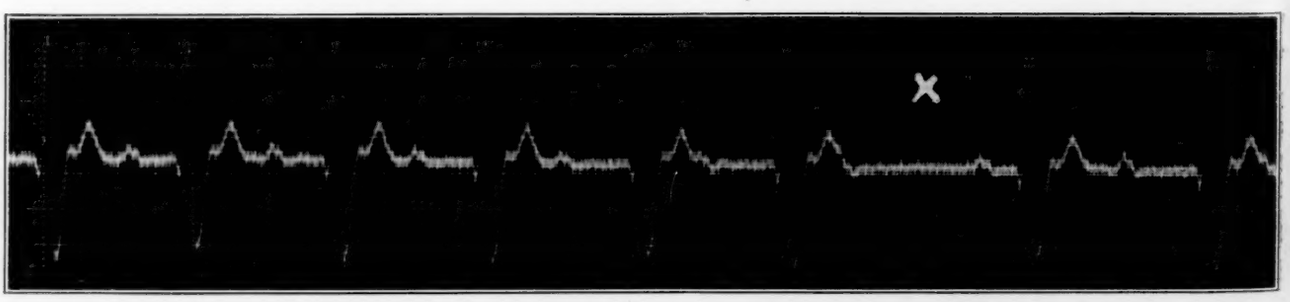

Fig. 70.—Lead 1 with a dropped beat at *x*, with gradual increase in the conduction time (P-R interval) before the conduction finally fails. Such a sequence gives rise to what is known as a Wenckebach period. An intraventricular block is also present here, the Q-R-S interval measuring 0.16 second.

drops to 60 or to 70 per minute, the dosage of digitalis should be decreased to avoid a higher degree of block.

In the paroxysmal type of unknown origin the patient is often suddenly attacked with precordial pain, dyspnea, vertigo, nausea, pallor, and perhaps even collapse (fig. 140). These attacks may be recurrent, or a single attack may persist for months or years. Individuals at or past middle life are the most frequent victims of this type of arrhythmia.

which a Q-R-S complex of supraventricular origin is followed by a premature Q-R-S complex of ventricular origin (figs. 114 and 115). The pauses following the coupling are longer than is the pause between the normal and the abnormal complex; they are usually of equal length. Fibrillation may be associated with complete heart block, as already seen; a fibrillation may also be associated with an impure flutter (figs. 51 to 60, 129, 137, 140 and 144).

VENTRICULAR FIBRILLATION

Ventricular fibrillation is a very rare, almost unique, disturbance of the ventricular mechanism so far as electrocardiographic evidence is concerned. In man, it has been thought to be the mechanism of death in many conditions. Its probable presence has been shown in a few electrocardiograms; however, not all published as such are acceptable. The usual records from the dying human heart reveal other changes as the common ones occurring at this time, as will be seen later. The

Fig. 71.—Incomplete heart block with dropped beats at *x*. The P-R interval gradually lengthens until no Q-R-S complex follows the P wave and then becomes shortest after the pause. Here, again, Wenckebach periods are evident.

mechanism of ventricular fibrillation is unknown. Its continuance for a minute or two means death, unless revival of the normal heart beat follows. Graphically, in ventricular fibrillation there is an irregular, very coarse, wide movement of the base line without any regular Q-R-S waves being visible (fig. 61).

HEART BLOCK

Heart block is a condition in which impaired conduction of stimuli from auricles to ventricles finally results in the ventricles contracting less frequently than the auricles. It is more common in males. It occurs at all ages. It may be caused by vagal effects, digitalis, rheumatic heart disease, mitral stenosis, arteriosclerosis and asphyxia, and in infarction, calcification, tumor or gumma of the septum involving the His bundle. Syphilis has been found to be responsible less commonly than was previously thought.

Heart block may be of any grade, from the slightest increase of the P-R interval (0.21 second) through the stage of occasional dropped beats, 4:3, 3:2, 2:1 and 3:1 block up to complete block.

Delayed A-V conduction represents the mildest type of heart block (figs. 63 to 67, 125 and 126). It cannot be recognized clinically, and is seldom even suspected without the aid of the electrocardiograph. Many cases are transitory, being due to vagal origin. In about 50 per cent of these cases, atropine causes the prolonged P-R interval to disappear in from ten to thirty minutes. This is an important sign in rheumatic heart disease and may be the only dependable diagnostic sign of cardiac involvement in a case of rheumatic fever (fig. 125). When present in such a case, the patient should be observed carefully and the diagnosis postponed. The characteristic graphic finding is prolongation of the P-R interval beyond 0.20 second. The length of the P-R interval is constant for the same patient but varies from patient to patient. Occasionally the P wave is inverted in one or more leads. The Q-R-S complex is frequently aberrant. The T wave is frequently inverted.

In other cases "dropped beats," representing second stage heart block, are found (figs. 69, 70 and 71). Clinical recognition of this type of heart block is seldom difficult, the pulse having a regular rhythm with a single beat occasionally or regularly absent. There may be a slight quickening of the ventricular rate before each dropped beat, but there is no tendency for several long pauses to occur in succession. This helps to differentiate dropped beats from extrasystoles, in which a weak premature beat occurs immediately before each pause. Heart block never gives rise to a pulse deficit. In the case of occasional dropped beats, the P-R interval usually lengthens progressively up to the completely blocked ventricular contraction and then becomes shortest after the pause (figs. 70 and 71). The result of this change in the P-R interval in the case of such occasional dropped beats is that the pause during which no ventricular contraction occurs is not twice the normal interval between two normal beats but is shorter, often by a considerable amount. This gives rise to arrhythmia, which becomes less marked in cases in which higher grades of block are present.

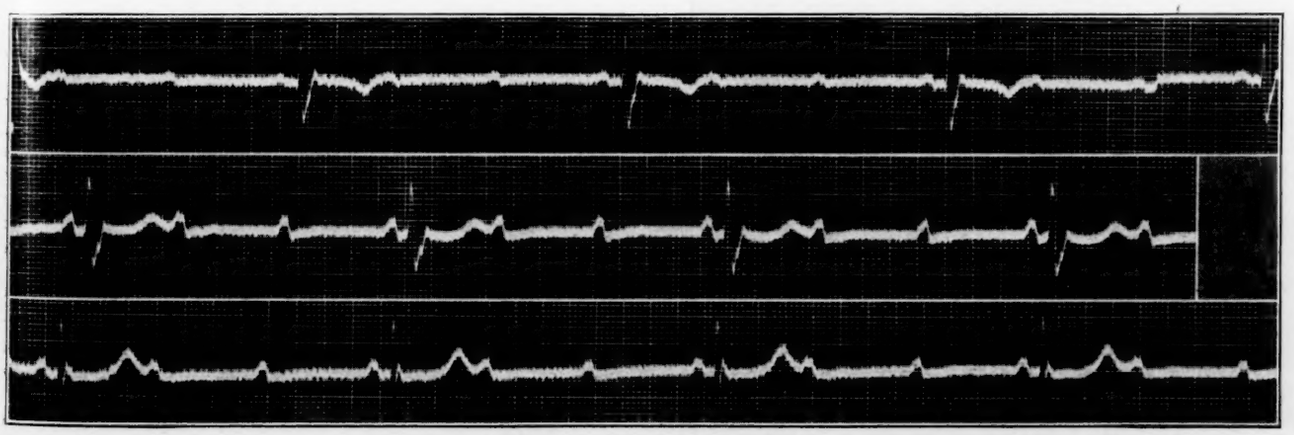

Fig. 72.—Partial (3:1) heart block, showing a ventricular contraction (Q-R-S complex) following every third auricular contraction (P wave). Auricular rate 90 per minute, ventricular rate 30 per minute.

PARTIAL HEART BLOCK

Partial heart block represents a still more advanced (third) stage of this disturbance. It may be only a temporary affair. It may coexist with, or be a forerunner of, a complete block. Here again some of the auricular impulses reaching the junctional tissues fail to provoke a ventricular response, but they do this more

frequently and more regularly than in second stage heart block. A 2:1 rhythm is the most common form; there may also be a 4:3, 3:2 or 3:1 type of block. The ratio here refers to the number of auricular contractions (P waves) as compared with the number of ventricular contractions (Q-R-S complexes) present. These rhythms never give rise to a pulse deficit, as occurs with extrasystoles and in auricular fibrillation. The radial pulse and apex beat show a similar rate and irregularity. A 2:1 rhythm may be confused

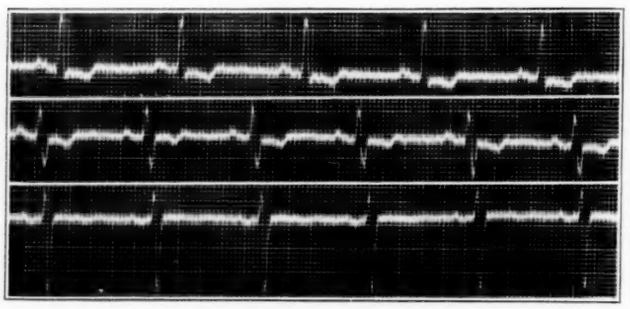

Fig. 73.—Delayed intraventricular conduction: Rate, 60 per minute. Q-R-S interval, 0.12 second.

with a sinus bradycardia. Strenuous exertion, amyl nitrite or atropine frequently changes it to a 1:1 rhythm with approximate doubling of the ventricular rate or development of a ventricular irregularity,

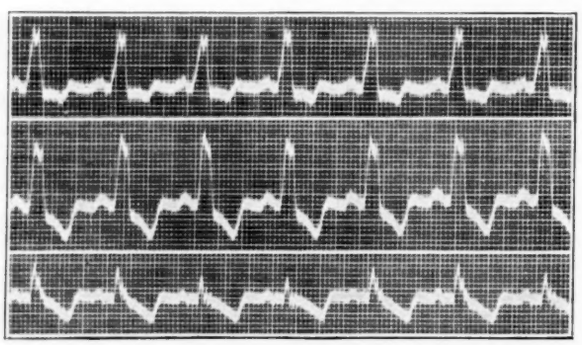

Fig. 74.—Delayed intraventricular conduction: Rate, 90 per minute. Q-R-S interval, 0.14 second. Severe myocardial damage, Q-R-S slurred and notched in all leads. S-$T_{1,2}$ depressed. $T_{1,2,3}$ negative.

whereas in sinus bradycardia there results a gradual increase in rate and never a sudden change in rate or development of arrhythmia, as in a 2:1 rhythm (figs. 72, 73, 74 and 126).

(To be continued)

Persistent Thymic States. — Theoretically, the thymus secretes a substance which has vagotonic properties, and practically this is frequently found to be borne out. So that persistent thymic states are accompanied by low blood pressures, slow pulse, hyperacidity, fatigability, and usually subnormal temperature. The genital apparatus is usually small, but besides this it also shows some lack of differentiation, so that the penis emerges from a scrotal fold which may entirely surround its base. . . . The blood picture frequently shows a moderate relative lymphocytosis, a slight eosinophilia and a low carbon dioxide tension of the blood plasma. The vascular system is somewhat deficient, the arteries being thin and small and the suprarenal glands usually are found small and inefficient. . . . As a result of all these factors, the patients are not sufficiently resistant to diseases and conditions which specifically attack the adrenals, such as diphtheria, scarlatina and influenza.—Timme, Walter: Lectures on Endocrinology, ed. 2, New York, Paul B. Hoeber, Inc., 1932, chapter II.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

H. A. CARTER, Secretary.

BARACH-THURSTON SOLARIUM OXYGEN TENT ACCEPTABLE

The Barach-Thurston Solarium Oxygen Tent is manufactured by the Oxygen Therapy Service, Inc., 133 East Fifty-Eighth Street, New York City. The manufacturer claims that this unit is an adjunct in the treatment of anoxemia resulting from acute pulmonary edema, coronary thrombosis, cardiac decompensation, pneumonia and carbon monoxide poisoning.

The oxygen tent consists of an air-conditioning and oxygen enriching unit, connected to a rubberized tent canopy supported above the bed, for the purpose of administering to a patient oxygen or a combination of oxygen and carbon dioxide. It is capable of maintaining therapeutic air environment at or below room temperature. Fan speed and volume of circulation are controlled by an electric motor-blower with multistep rheostat.

The Air-Conditioning Unit is an air-tight ice compartment, partitioned through the center and forming two separate ice chambers, thereby permitting single or double circulation of circulating atmosphere through ice by means of a manually operated by-pass. Each chamber of this ice compartment measures 12 by 16½ by 19 inches and is made of rust resisting metal, the broken-ice capacity of the compartment totaling 150 pounds.

Barach-Thurston Solarium Oxygen Tent.

The ice chambers are fitted with by-pass, automatic drain and double water seal. The air-conditioning unit is insulated against cold loss and is provided with two interchangeable petcocks to permit oxygen and carbon dioxide inflow, and for oxygen concentration analysis. The air-conditioning unit is so constructed that the inlet and outlet tubes to and from the tent canopy are never directly connected with the motor-blower, but atmosphere circulated passes through secondary silencing chambers and tubes. This unit is equipped with two seamless tubes extending through the top of the ice compartments for conducting air and oxygen to and from the tent, and also for service as adjustable supports for the tent canopy (or tent fabric), the adjustment range of the canopy being 14 inches vertically. It is provided with a single large door in the top of the ice chamber, fitted with a suitable air-tight locking device and permitting the filling of one or both ice chambers as is required. A soda lime container capable of holding 5 pounds of soda lime is located in one of the ice compartments beneath the air duct.

Oxygen inlets and testing connections are on the tent support tubes, near the tent inlets. Oxygen may be delivered either directly to the air tubes leading into the tent or into the tube taking air from the tent and conditioning it before delivery to the tent.

Located in a separate, sound insulated, compartment beneath is mounted a universal type motor-blower unit, connecting with the ice chambers, for discharging cooled, dehumidified and conditioned air into the tent canopy and exhausting used air from it. This motor-blower is capable of providing a complete change of air at least once in every minute at high speed, and is controlled externally by a suitable rheostat. An informatory red pilot light is provided to signify that the motor circuit is being supplied with electric current.

The tent canopy is made of rubberized fabric and is supported from two rods projecting over the bed. The shape of the canopy is that of a truncated pyramid, approximately 40 by 24 inches at the top, with a 13 foot sweep (perimeter) at the bottom, and 60 inches in vertical length. It is provided with five windows of a transparent noninflammable material, one large window, 20 by 25 inches, in each face of the tent, and a skylight

window in the top. The canopy is easily detachable from the supports for purposes of sterilization or transportation.

The air-conditioning unit is of Duco green finish (or any other standard color desired). Trimmings are of bronze (or nickel-plated) finish. Roller bearing, rubber-tired hospital casters with 3 inch diameter special rubber wheels, full swiveled to permit of free movement, are provided. Each tent is provided with an oxygen concentration analyzer (or testing apparatus), twenty-five feet of standard rubber-coated electric cord, and four feet of low pressure rubber tubing.

A hygrometer of wet and dry bulb type (Humidiguide), a bacteria filter, or other accessories, may be purchased. The oxygen regulator is a comparative type, calibrated to 15 liters per minute with silencer, and fitted with an adapter for increasing the flow five times the liter dial reading. A water bottle is provided to allow the oxygen to bubble through, thus making visible the amount of oxygen entering the tent. The shipping weight is 350 pounds.

The Council on Physical Therapy declares the Barach-Thurston Solarium Oxygen Tent eligible for inclusion in its list of accepted devices.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

WHITE OAK BRAND CRYSTAL WHITE SYRUP

(85 Per Cent Corn Syrup, 15 Per Cent Rock Candy Syrup)

Manufacturer.—Wheeler-Barnes Company, Minneapolis.

Description.—A table syrup; a corn syrup base (85 per cent) with rock candy syrup (15 per cent).

Manufacture.—Corn syrup (THE JOURNAL, March 5, 1932, p. 817) is mixed with a rock candy syrup, an extra large crystallized cane sugar, in the foregoing proportions. The rock candy syrup is prepared by melting large crystal cane sugar. The melt is boiled and filtered. The mixture is heated to 82 C. and automatically packed in air tight tins.

Analysis (submitted by manufacturer).—

	per cent
Moisture	24.9
Ash	0.2
Fat	0.0
Protein (N × 6.25)	0.02
Reducing sugars, as dextrose	18.6
Reducing sugars, as dextrose after invertase inversion	29.4
Sucrose (estimated from reducing sugars)	10.8
Dextrins (by difference)	34.7
Sulphur dioxide	trace

No methods are available for accurately determining the composition of syrups of this nature; therefore the foregoing analysis is roughly approximate.

Calories.—3.0 per gram; 85 per ounce.

Claims of Manufacturer.—A syrup for baking, cooking and table use and as a carbohydrate supplement for milk modification for infant feeding.

MALT-O-MEAL

Wheat Cereal Flavored with Specially Prepared Toasted Malt

Manufacturer.—Campbell Cereal Company, Northfield, Minn.

Description.—A breakfast cereal; a mixture of farina (purified wheat middlings) with sufficient toasted malted barley to give the product a malt flavor.

Manufacture.—Farina is admixed with sufficient toasted, ground and bolted malt to give the mixture a malt flavor, is heated to destroy any insect infestation, and is automatically packed in cartons.

Analysis (submitted by manufacturer).—

	per cent
Moisture	11.5
Ash	0.5
Fat (ether extraction method)	1.2
Protein (N × 5.7)	10.9
Reducing sugars as maltose	1.6
Crude fiber	0.9
Carbohydrates other than crude fiber (by difference)	75.0

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—A malt flavored farina breakfast cereal.

(a) KING OF KANSAS FLOUR (BLEACHED) (b) LARABEE'S CREAM LOAF FLOUR (BLEACHED) (c) OLD DOMINION FLOUR (BLEACHED)

Manufacturer.—(*a*) Monarch Milling Company, (*b*) Larabee Flour Mills Company, (*c*) Larabee Corporation, subsidiaries of the Commander-Larabee Corporation, Minneapolis.

Description.—"Standard patent" or "long patent" hard wheat flours; bleached.

Manufacture.—Selected hard winter wheat is cleaned, washed, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended and bleached with a mixture of benzoyl peroxide and calcium phosphate (three-fourths ounce per 196 pounds) and with nitrogen trichloride (from 1/14 to 1/5 oz. per 196 pounds).

Analysis (submitted by manufacturer).—

	per cent
Moisture	13.0 –14.5
Ash	0.42– 0.46
Fat (ether extraction method)	0.9 – 1.7
Protein (N × 5.7)	11.0 –11.6
Crude fiber	0.2 – 0.4
Carbohydrates other than crude fiber (by difference)	74.5 –71.3

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—The flours are especially designed for commercial bread baking.

REPORTS OF THE COMMITTEE

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

RAYMOND HERTWIG, Secretary.

"BUTTER KRUST TOAST" NOT ACCEPTABLE

The Butter Krust Toast Company, Minneapolis, submitted to the Committee on Foods a uniformly toasted sliced bread called "Butter Krust Toast" made from a slightly sweetened dough containing patent wheat flour, water, sucrose, salt, yeast, lard, sweetened condensed milk and cardamom flavor (extract of a fruit of the ginger family).

Analysis (submitted by manufacturer).—

	per cent
Moisture	7.5
Ash	1.4
Fat (ether extraction method)	2.0
Protein (N × 6.25)	12.0
Crude fiber	0.5
Carbohydrates other than crude fiber (by difference)	76.6

The name "Butter Krust Toast" infers the presence of milk-fat in sufficient quantity to give the toast distinctive nutritional values, flavor or other qualities due to added butter. Lard is the chief shortening ingredient of the baking formula; no butter is used and the small quantity of milk ingredient contributes little milk fat; therefore the name is inappropriate for the product, is misleading and misinformative.

On being advised of the opinion of the Committee the manufacturer replied that the product has been merchandized under its present name for a number of years and "it would be out of the question . . . to consider (its) renaming. The name was originally adopted because of the use of the name 'Butter-Krust' in connection with bread . . . in this territory." This product, therefore, cannot be listed among the Committee's accepted foods.

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SATURDAY, OCTOBER 15, 1932

PROFESSOR PUCKNER AND THE COUNCIL ON PHARMACY AND CHEMISTRY

The death of Prof. William A. Puckner on October 1, after more than twenty-six years of service as Secretary of the Council on Pharmacy and Chemistry, marked an epoch in the work of that body. A brief note concerning his career was published in THE JOURNAL last week. In February, 1905, the Board of Trustees adopted a resolution creating the Council, and Professor Puckner took office as Secretary on March 1, 1906. It is interesting to realize that three of the members of the Council at its inception—namely, Drs. George H. Simmons, Torald Sollmann and Robert Hatcher—are still members of that body and that they with Professor Puckner were a vital force in its activities during its first quarter century. It is needless to recapitulate the many vital functions that the Council has fulfilled. It has aided in the elimination of secrecy in medical prescription; it has discouraged misleading statements; it has standardized new preparations before their inclusion in the Pharmacopeia, and it has brought the medical profession of this country to a better realization of scientific therapeutics than obtains anywhere else in the world. In its work the Council has had the approval of the majority of the medical profession, if not their constant cooperation.

In 1909, shortly after taking over his duties as Secretary of the Council, the vision of Professor Puckner became so impaired that it was necessary for him to give up laboratory work entirely and, indeed, to have the services of a guide in getting about. Nevertheless, his memory was so remarkable, his grasp of affairs so embracing, and the force of his character so tenacious that he carried on his work efficiently almost to the day of his death. As Secretary of the Council he exercised a rare judicial attitude toward the problems that came before him, at the same time evidencing a scientific point of view in his evaluation of both laboratory and clinical evidence.

As was intimated in a preceding sentence, the Council on Pharmacy and Chemistry has had up to this time the appreciation of organized medicine and a recognition of the ideals which guide it, if not the active cooperation of the majority of practicing physicians. Certainly the first quarter century of its work must have proved to physicians the desirability of such activities as it has carried on and indeed their necessity for the advancement of scientific pharmacy and therapeutics. The Board of Trustees will, at its next meeting, select a successor to the man who served as field marshal in the campaign for scientific therapy during the last twenty-five years. His position brought on him not infrequently bitter attacks and even the enmity of some of the commercial interests that considered themselves damaged by the Council's work. The next epoch in the career of the Council should have the cooperation of practicing physicians so complete as to indicate to manufacturers in the field of pharmacy the necessity for maintaining scientific standards if they wish medical support.

DEPRESSION DEATH RATES

Persons who accept statistics at their face value may be deceived by the excellent health record for 1932, which, on the face of official returns, persists in spite of economic depression and, according to some writers, partly at least because of the depression. Obviously fatal industrial accidents will decrease as a direct result of unemployment. There may also be temporary diminution in the number of breakdowns due to diseases which are unfavorably influenced by industrial employment. Possibly persons with tuberculosis, heart disease, kidney diseases and high blood pressure may live a trifle longer in consequence of enforced rest, due to unemployment. Obviously, also, traffic accidents may be fewer, or at least the rate of increase will be retarded, in consequence of the storage of large numbers of passenger and commercial cars and fewer new cars placed in service. Few owners have money to spend on pleasure driving, and shrinkage of business reduces the need for commercial transportation. Some minor beneficial effects have been claimed for enforced reduction in tendencies to the overeating of rich foods, but convincing proof has not been offered to support such assertions. These are apparently the immediate beneficent effects of an economic depression. To a certain extent they are reminiscent of the favorable mortality statistics immediately following the great pandemic of influenza in 1918. Tuberculosis, heart disease, cancer and other causes of death showed a marked improvement following the influenza epidemic, but wise and experienced statisticians were not slow to point out that these apparent improvements represented merely the distortion of normal death rates due to the anticipation of certain deaths, because many persons who would otherwise have died during these postinfluenzal years had succumbed a few months or years sooner to influenza superimposed on their other disease.

The public must look much further than merely at a current figure for the ultimate effects of a depression. Just as the European central powers are still paying the penalty of malnutrition among their children, due to food shortages during war blockades, so must we expect to experience in the future some of the effects of what economic distress, curtailed employment and enforced economy are doing to our people today.

While a few adults may be saved by economic necessity from the results of gluttony, the fact that thousands of children are suffering from malnutrition is more important. True, the social service agencies, in general, have shown wisdom and far-sightedness in maintaining adequate and well-balanced diets, especially for children among those dependent on community or private charity during the depression. Too often the social agency has been under fire from unthinking persons, who still regard certain essential foodstuffs, such as orange juice and butter-fat, as luxuries rather than necessities. What is happening to the families that have reduced their food budget, perhaps unwisely, and are still grimly making their own resources do, without community aid? Consider also other ways in which economic pressure leads to serious neglect of health. Dentistry is neglected, or at least postponed, and in consequence the future will reveal sequelae in focal infections, arthritis, rheumatic conditions and heart disease.

The next few years will bring to light the results of delayed or omitted medical treatment. Milder manifestations of disease during the depression are likely to be borne without relief, or treated by self-medication, until imminent disaster compels an eleventh-hour resort —often too late—to competent aid. Surgery which ought to be done is not being done. What the surgeon calls operations of choice, namely those performed when the patient is in the most favorable condition, have been largely replaced by operations of necessity, namely emergencies that can no longer be postponed. Needless to say, the surgical risks under such circumstances are greatly increased. This situation may be expected to react unfavorably on mortality from appendicitis, gall-bladder disease, cancer and hernia.

It is not wise to be too optimistic about the effect of business adversity on the public health. There may be a few immediate benefits, more apparent than real, but, in the long run, no condition of prolonged depression and anxiety can inure to the benefit of the public health.

From the physical point of view alone, the economic depression must inevitably leave many regrets. Moreover, unemployment and loss of economic security are already revealing destructive influences in mental hygiene. The only real benefit that may be anticipated from this economic crisis is the possibility that more people will think seriously about human relationships. There is no lack of such lessons in this period of depression! How many minds have the capacity to appreciate them?

VOICES ACROSS THE RIO GRANDE

Station XER, just across the Rio Grande from Del Rio, Texas, is the mouthpiece of John R. Brinkley, goat gland transplanter, mail-order dispenser of medicines and candidate for Governor of Kansas. The station has apparently been authorized by the Mexican government to increase its power from 75,000 to 500,000 watts, which will make it ten times more powerful than any station in the United States. There is no need to tell readers of the THE JOURNAL anything about the record of Brinkley in either medicine or politics, or as an announcer over the radio. The government of the United States stopped his broadcasting at Milford, Kan., and he built the station in Mexico to get around that prohibition. In a recent report in *Collier's* it was alleged that Vice President Curtis had gone personally with Brinkley to the state department to use his influence in preventing any interference by the state department with Brinkley's license to broadcast from Mexico. According to the report just made available in the Chicago *Tribune,* the new grant is said to be signed by the Mexican Minister of Communications and Public Works, and Brinkley is to pay the Mexican government $15 a day for the privilege of using the new high power. Experts in radio engineering indicate that the use of a current of such potency by the Brinkley station will interfere seriously with any station in the United States operating on a channel within 50 kilocycles of that used by the Brinkley station. Apparently, Brinkley can put potency into his radio broadcasting even if the goat glands will not perform a similar function for the misguided octogenarians, or instances of sexual impotence, psychic or otherwise, induced to submit to grafting operations by what they hear from over the Rio Grande. A letter just received by the American Medical Association from the Camara Nacional de Comercio de Nuevo Laredo indicates that Cancer Quack Norman Baker contemplates building a station at that place, presumably to promote the industry formerly exploited through his station in Muscatine, Iowa.

It should be obvious to any one, including even the Vice President of the United States, that the purpose of these stations on the Mexican border is to invalidate the attempts of the Federal Radio Commission to keep clean the material coming through radio channels into this country. What hope is there that this object can possibly be achieved if the Mexican government is to dedicate the southern bank of the Rio Grande to these American outcasts? The Federal Radio Commission carefully limits the power granted to various stations and definitely defines the channels through which they transmit. Apparently, the Mexican government is more concerned with the possible income that may be derived from the licensing of outlawed American stations than with the detriment to American health and sanity that ensues therefrom.

If this Mexican practice is to continue without interference, American users of the radio may well

anticipate for the coming years as the dominating theme of the broadcasts to which they may listen the lamenting and feeble baa-baa of the castrated goat and the blatant charlatanism of Norman Baker. Oft in the stilly night will come the voices from over the Rio Grande beseeching the use of the liver pill, the kidney pill and the woman's pill. The radio industry itself and the telephone company that leases its wires for such broadcasting by remote control may well begin to consider the damage that they are likely to suffer from the rottenness that is developing within.

Current Comment

AVITAMINOSIS AND URINARY CALCULI

Early in the development of modern knowledge about the vitamins, Osborne and Mendel [1] called attention to the frequent occurrence of urinary calculi in experimental animals kept on diets devoid of vitamin A. This symptom, which is almost as characteristic as the more readily observed xerophthalmia, has since been recorded by many investigators.[2] Urinary calculi are common in man in the countries of the Far East. On this account, in particular, it is interesting to learn from the studies of McCarrison [3] that he observed renal calculi in more than one fifth of the animals raised by him on diets made up of food in common use by the people of India. This condition was prevented by supplementing the ration with a good source of vitamin A. McCarrison states that no tissue suffers more severely from want of this food factor than that of the urinary tract. He suggests, further, that the keratinized epithelium from this tract may form the nidus around which the deposition of calculi occurs. There are many indications that the primary effect of lack of vitamin A is an interference with the normal function of epithelial tissues, though not necessarily all types of these cells. Most investigations have been conducted on the rat as an experimental animal. The latest researches at the University of Wisconsin by Elvehjem and Neu [4] indicate that in birds the kidneys undergo definite pathologic changes as the result of deprivation of vitamin A. The injury to renal structures is sufficient, as a rule, to prevent the normal elimination of uric acid—the end-product of nitrogenous metabolism in that species. Elvehjem and Neu argue that man occupies an intermediate position between birds and mammals other than man in regard to the destruction of uric acid. The changes observed in the uric acid excretion in birds during vitamin A deficiency are therefore probably more applicable to man than to most species. New views are thus presented for the consideration of the origin of certain types of human renal calculi in relation to inadequate diets.

1. Osborne, T. B., and Mendel, L. B.: The Incidence of Phosphatic Urinary Calculi in Rats Fed on Experimental Rations, J. A. M. A. **69:** 32 (July 7) 1917.
2. van Leersum, E. C.: J. Biol. Chem. **79:** 461 (Oct.) 1928.
3. McCarrison, Robert: Brit. M. J. **1:** 1009 (June 13) 1931.
4. Elvehjem, C. A., and Neu, V. F.: Studies in Vitamin A Avitaminosis in the Chick, J. Biol. Chem. **97:** 71 (July) 1932.

NEW FORMS OF MEDICAL PRACTICE

In the department of Medical Economics in this issue appears the second of a series of articles to be published in THE JOURNAL, describing schemes for medical practice developed by various agencies in this country. Last week the report concerned a corporation, controlled largely by business men, which proposes to vend the services of salaried physicians to the public. This week the account concerns an insurance scheme, again controlled largely by business men. Among the most significant of the statements relative to the organization known as the Columbia Casualty Company is that concerning the distribution of the dollar paid into the company for medical care. Of this, 45 cents is set aside for medical care not including the cost of hospitalization, 12½ cents represents the cost of hospital service, and 42½ cents is used for promotion, organization, sales, administration and profits. It is typical of all the schemes developed by business men for the vending of medical service that the amount of money used for promotion of the scheme and for profits to the promoters equals, if it does not surpass, the amount actually expended on medical care. Certainly it will hardly avail the public greatly in the lowering of the cost of medical care if a considerable portion of the dollar now expended for such service is diverted from the medical profession and from medical institutions into the pockets of promoters and business men. Any insurance scheme that proposes to lower the cost of medical care through enlisting a large number of persons in the scheme and vending to these persons the services of a limited group of physicians should not do so either by exploiting the services of physicians who participate in order to pay adequate financial returns to the business men involved or by giving to the persons concerned medical care inferior to the average now available for the majority of people.

IRRADIATED SURGICAL ANTISEPTIC

The discovery in medicine of any new technic or process leads promptly to extended research with similar measures. Last year, Eising [1] reported encouraging results by treating purulent wounds with irradiated petrolatum. This report led Ross [2] of the University of Oregon Medical School to test the effects in vitro of such irradiated surgical dressings. Briefly, Ross found that a 2:1 mixture of petrolatum and hydrous wool fat, after ultraviolet irradiation for four hours, had acquired a sufficient bactericidal power to kill Staphylococcus aureus and Bacillus pyocyaneus within twenty-four hours. Control tests with non-irradiated mixtures of these substances gave negative results. The irradiated antiseptic suffered no appreciable reduction in bactericidal power on ordinary storage for one week. Ross is inclined to attribute the new antiseptic properties to "secondary ultraviolet emanations" held by the petrolatum-hydrous wool fat mixture, a conclusion previously drawn by Eising. Whether or not the new antiseptic is neutralized,

1. Eising, E. H.: Ann. Surg. **43:** 123 (June) 1931.
2. Ross, A. T.: Proc. Soc. Exper. Biol. & Med. **29:** 1264 (June) 1932.

inactivated or otherwise rendered inert in the presence of purulent exudates has not yet been tested in vitro. Nor is there anything in Ross's data to suggest a clinical superiority of this unknown "emanation" antiseptic over ordinary commercial antiseptics added to non-irradiated mixtures of petrolatum and hydrous wool fat. Far more extended and controlled researches are necessary before such results are permitted to breed new proprietary remedies.

Medical Economics

NEW FORMS OF MEDICAL PRACTICE

2. "Columbia Casualty Company"

The Columbia Casualty Company, 1 Park Avenue, New York, proposes to operate in the Pacific coast states a plan to furnish medical service at from $3 to $10 a month to those who purchase its policies for such service.

The Columbia Casualty Company was incorporated under the laws of New York, Feb. 4, 1920, received its license from the insurance department, February 21, and commenced the writing of business about May 1, with an authorized capital of $800,000 and a surplus of $400,000 fully paid up in cash. The company was organized by interests allied with the Ocean Accident & Guarantee Corporation, Ltd., of London, England, which owns its entire capital stock except for the directors' qualifying shares. The management of the company is under the direction of the United States branch of the Ocean Accident & Guarantee Corporation and its business is handled by the same organization. The plan for flat rate medical service seems to have been developed and was outlined to the Bureau of Medical Economics of the American Medical Association by Mr. J. R. Molony, with offices in San Francisco. It is impossible to state whether the plan was conceived or influenced by the Ocean Accident & Guarantee Corporation, but on Dec. 31, 1931, the amount of stock owned by the directors of the Columbia Casualty Company was $400. The remainder, $999,600, being owned by the Ocean Accident & Guarantee Corporation, Ltd., London, England.

The plan, as outlined, provides four grades of service, differing principally with respect to the hospitalization provided. The cheaper grades furnish only general ward and floor nursing without drugs and medicine for a period of not more than six weeks. The highest class of service provides for hospitalization for twenty-six weeks, with a private room at a cost not exceeding $15 a day and whatever nursing service, drugs and medicines may be prescribed by the attending physician or hospital. The other grades of service provide care midway between these two.

ARRANGEMENTS WITH PHYSICIANS AND HOSPITALS

The administration of medical service has been separated as far as possible from the financial administration of the company. It is specifically provided that the company shall have no control over the character of the medical practice. Medical and hospital groups are given a contract with the Columbia Casualty Company constituting the medical division as a largely separated organization. One paragraph of this contract provides that:

> WHEREAS, the parties hereto recognize and endorse the efforts of the medical profession to maintain and raise standards of practice both through individual effort and collective association activities, and agree that the insurance solution of this problem now undertaken must embody fundamental principles not at variance with the principles of the American Medical Association, the American College of Surgeons and the American College of Physicians; and therefore the following declaration of intent is made by all parties at interest hereto.

The medical groups are selected to cover specific territories, and the contract is made with the group. While the original selection of the members of the group is made in the beginning by the promoters of the insurance plan, the contract provides that no addition may be made by any such group except by unanimous consent of the members of the group. Furthermore, the author of the plan stated that arrangements were being made for a central, controlled group of physicians who would name the physicians who might be solicited to form a new group in any new locality in which such a group does not now exist.

There is to be no use of any physician's name in any advertising, and all advertising must be approved by the medical groups before being issued.

Payments for medical service are provided for by setting aside 45 per cent of all premiums for medical service aside from hospitals and 12.5 per cent for hospitalization. This leaves 42.5 per cent to use for promotion, organization, sales, administration and profits.

It is proposed to organize a corps of salesmen working on a commission, which is expected to be fixed at 20 per cent, selling the insurance to individuals. Provisions are also made for group insurance sales, but this portion of the scheme is like similar schemes in operation elsewhere, except that the medical care required will be provided by the medical groups already described.

The money that goes to physicians is to be divided within the medical group according to a plan worked out by that group itself. The promoter stated that the fee schedule which has been tentatively adopted is an adaptation of the French plan. By this system the lowest medical service, an office visit without treatment, is counted as one unit. All other services are considered as a certain multiple of this unit. The total sum assigned to a group would then be divided by the total number of units of service supplied by the members of that group. Each individual would then receive payment according to the units of service rendered by him.

CRITICISM OF THE PLAN

If the general concept of insurance is accepted, this plan is difficult to criticize. It has been formulated by expert insurance men cooperating with able physicians with a view to meeting the objections generally raised against contract practice. Nevertheless, there are serious objections. The plan provides for no free choice of physician except that of the insurer when he decides to accept the services of the group. The plan has already arranged to merge a number of schemes now existing in California, including one now asserted to have 40,000 patients —the Moore-White Clinic of Los Angeles. With such an arrangement, the evils existing in these previous groups will unavoidably influence the new scheme.

The medical care must be given by the physicians belonging to the specially selected and organized groups or their assistants. The plan makes no clear provision regarding the number of assistants employed by any physician within the group or the methods of compensation. This opens the way to the defect existing in the original British law, now removed by amendment, by means of which the physician hired a number of cheaper assistants who did work for less than was paid in the insurance plan, the difference going to the physician at the head of the group. Mr. Molony states that there are two safeguards against this abuse: First, the physician who is a member of the group is required to assume full responsibility for all diagnosis and treatment; second, the group itself would not permit any member to undertake a form of practice which might deteriorate the service to the profit of the individual with the assumed injury of the other members of the group.

The plan inevitably provides for the exclusion of most of the medical profession from its operation. Recent graduates could enter the profession only by becoming assistants to members of the group or by attempting to obtain a foothold in the greatly overcrowded and constantly diminishing field of private practice. The whole scheme rests on solicitation by salesmen at a profit to the managing corporation.

Perhaps the worst feature of the plan is the certainty that it will disrupt the profession in any community in which it is established. Mr. Molony admitted that rumors of the plan aroused opposition within local medical societies. He stated that no cooperation had been sought and no consultations held with organized medicine in California.

The promoter expects to gain the support of 20 per cent of the medical profession within a comparatively short period.

He has evidently succeeded in securing the interest, if not the adherence, of some leaders of the profession in certain localities. This he can do, because his plan seems to offer greater security of income and probably a much higher income than the average physician now receives.

It seems certain that the establishment of this plan, while benefiting a minority of the profession, will disorganize and impoverish the majority. Most independent physicians cannot hope for any considerable share of private practice in competition with the high pressure salesmen employed by the insurance companies.

Mr. Molony has said that there are other insurance companies already considering this field. It is his belief that the Columbia Casualty Company, by being first, will be able to skim the cream from the insurance system. He expects to secure the most capable physicians and has shrewdly outlined his scheme so as to appeal to the class of laymen most susceptible to an insurance scheme. This is the class with incomes from $2,000 to $10,000 a year that find it difficult to save to meet catastrophic illness but that could afford the $5 a month, which he assumes will be the average premium. If this class is absorbed by insurance, only the luxury and poverty practices remain for the private practitioner.

Once there are a number of competing insurance schemes in the field poorer grades of the population will be successively tapped by schemes offering cheaper and inferior service. The next step in such competition in every country has always been that the payment for medical service is cut with the further deterioration of the medical service and a decline in professional influence.

ECONOMIC STATUS OF THE MEDICAL PROFESSION

A Suggestion for Improvement

B. T. BEASLEY, M.D.
ATLANTA, GA.

Although the medical man is suffering financial losses probably greater in proportion than any other class of individuals as a result of the financial crisis through which the entire world is passing, this does not represent the grave problem which he must face in the future. The depression has made him take stock and analyze his status from the standpoint of cause and effect. His losses may be attributed to a number of factors and not entirely to any one cause. To arrive at a definite conclusion in his analysis he must not mistake cause for effect and effect for cause. The greatest cause of his loss lies deeper than the present financial upheaval. It goes back to the law of supply and demand. A ready market for any commodity, whether it be crude or manufactured products or service for any class of individuals, depends on the demand for such commodities or service. If production is only sufficient to supply the demand, there will be a stable market. If, however, production is in excess of the demand, the market will be flooded, with corresponding losses to the producer.

In the United States there is a demand for only a certain amount of paid medical service. That amount of service is represented by the amount of work a certain number of medical men can do as an average, and the income for service is based on the amount of service rendered.

During the past half century the demand for medical service has been reduced as a result of discoveries by medical men for the prevention of disease and as a result of the campaigns conducted by organized medicine aided by municipal, state and federal government and social units in an effort to eradicate preventable diseases. The demand for pay service has been further reduced by the conduct of free clinics, charity hospitals and service rendered free by municipalities, states and the federal government. One of two things must follow if the demand for service is reduced—the doctor must charge more or take his losses. If he charges more, he will be accused of profiteering. A national committee has already been appointed to investigate the high costs of medical care. If he takes his losses, he automatically takes his place among that large class of workmen who have had no special training. If the demand remains constant and production is in excess, or if the demand is reduced and production remains constant, the result will be the same; but if the demand is reduced and production is increased, the result will be a stagnation in trade and a panic will result. This is exactly the predicament facing the medical profession at present. Not only has demand for paid medical service been reduced, but there has been a rapid increase in the production of doctors during the nineteenth century all out of proportion to the increase in population. At the beginning of the twentieth century there was a reduction in the number of doctors until the line of increase curved beneath the population line. In 1922 the line started north, at present lies far north of the population line and is year by year going farther north.[1]

Another factor that must be taken into consideration is the quality and amount of service the medical man can render; this is determined by his ability, and his ability depends greatly on his training and circumstances. In the horse-and-buggy days and typhoid epidemics, more doctors were needed.

In 1906, out of the 5,364 doctors graduated in that year, only 267 came from colleges well equipped to give thorough training, whereas in 1931 all graduates came from class A colleges. The number of graduates from inferior colleges rapidly decreased from 1904 to 1919, at which time practically all class B and C colleges were discontinued, and at the same time there was a rapid increase in the number of well trained men. In 1922, the total number of graduates for that year decreased to 2,529, all or practically all class A men; since 1922 there has been a rapid increase in the number of graduates each year except in 1926, until at the present time the seventy-six colleges (all class A) are graduating a sufficient number to supply the world. At the present rate of increased production of doctors and decreased demand for paid service the next few years will see a doctor for each pay patient. Since 1921 there has been 1 doctor graduated for every 402 increase in population. Each year there is an increase over the preceding year. The Medical Department of the University of Georgia graduated 46 per cent more this year than last, and Emory University Medical Department graduated 11 per cent more.

The world's supply of doctors is 1 doctor to 2,070 people. In France there is 1 doctor to 1,697 people; in Germany there is 1 to 1,552 people; in the United States there is 1 to 789 people; in Georgia there is 1 to 1,007 people, while in Atlanta there is 1 doctor to 518 people. In an article entitled "Over Production?" in the *American Medical Association Bulletin* for June, 1932, the following statements were made:

"'The number of physicians in France continues to increase faster than population.'

"'In Hungary the number of physicians exceeds 8,000, which is too many.'

"'The new medical students (in Germany) enrolled for the past few years have greatly exceeded the estimated number of assimilable young physicians. It is evident that, during the past three years, 7,800 more medical students than needed have received training.'

"The sentences quoted above are taken from letters from Berlin, Budapest and Paris and are repetitions of statements that have appeared very frequently within recent years.

"In 1900, with horseback and horse-and-buggy transportation, with few telephones and with certain diseases very prevalent that are now comparatively rare, the medical schools of the United States turned out 5,214 graduates. In 1930 less than half as many schools produced 4,565 young physicians. In the meantime there has been almost unbelievable improvement in transportation and in all the facilities of communication and there has been a remarkable diminution in the prevalence of

Read before the Fulton County Medical Society, Aug. 18, 1932.

1. Charts showing the comparative increase of medical graduates and the increasing number of well qualified graduates appeared in THE JOURNAL, Aug. 17, 1929, p. 530.

certain diseases that formerly kept physicians busy. In the meantime, also, the number of hospitals has increased tremendously. While comparatively few of the graduates of the schools of the United States go to other countries, a very considerable number of the graduates of the medical schools of other countries come to the United States, year after year. Approximately 3,000 physicians die in the United States each year. It is estimated that the population of this country will be 'stabilized' within a few years. There is 1 physician for each 780 of the population. In 1931 there were enrolled in our medical schools 385 more students than in 1930 and the number of graduates increased by 170."

Conservatively estimated, at least 50 per cent of the sick in Atlanta are charity patients, thus leaving each doctor a little community of only 259 people who are able to pay. There are approximately 700 doctors in Atlanta. Placing the quota on the world basis, there should be 174; on the quota in France there should be 212. In Nashville there is 1 doctor to 362 people, in Boston 1 to 306 people, and in Philadelphia 1 to 494. It is reported that 150 doctors in one large city of the North are in the bread line. I have been reliably informed that a large number of doctors in other cities, including Atlanta, are behind with their office rent and unable to meet other obligations (table 1).

To determine the quota this country should have is a very difficult task, owing to the rapidly changing order of things. The social status of the entire country is on an entirely different plane from what it used to be; economic conditions have been completely transformed; commercial activities have been revolutionized by speed and machine power. It used to take a crew of five men to operate a train of twenty-five cars. Today five men can operate a train of 150 cars. With modern facilities

TABLE 1.—*The Number of Doctors in Different Sections as Compared with the Number There Should Be According to the Quota in the Entire World, in France and in Germany*

Place	Medical Population	What It Shoud Be According to the Quota of		
		World	France	Germany
United States	156,440	59,311	72,348	79,043
Alabama	2,207	1,278	1,559	1,705
Birmingham	431	125	153	167
California	10,109	2,742	3,345	3,658
Los Angeles	2,953	598	729	797
Florida	1,762	709	865	942
Jacksonville	199	62	76	82
Georgia	2,888	1,405	1,713	1,874
Atlanta	696	174	212	232
Chicago	6,399	1,631	1,989	2,175
Louisiana	2,076	1,015	1,297	1,354
New Orleans	820	221	270	293
Boston	2,549	377	460	503
Mississippi	1,567	970	1,184	1,294
North Carolina	2,372	1,531	1,868	2,042
Charlotte	140	39	49	53
New York City	8,077	2,034	2,481	2,713
South Carolina	1,292	839	1,024	1,120
Charleston	117	30	36	40
Tennessee	2,962	1,264	1,542	1,685
Nashville	425	74	90	99
Texas	6,475	2,813	3,432	3,755
Houston	506	141	172	188

one man can do the work of many under the old methods. The same principles can be applied to the medical profession.

In Persia there is 1 doctor to every 40,000 people. This quota is too high. In Boston there is 1 doctor to every 306 people. This quota is entirely too low. These two quotas represent the two extremes. In Persia it goes without saying that a large number of sick people get no medical attention, while in Boston a great many well people get medical attention if the doctors have employment (table 2).

Doctors in the large cities can no longer depend on drawing on the surrounding country for practice, because most of the small town people are having their work done at home. Almost every small town today has a hospital with well trained men doing excellent work.

France and Germany more nearly represent the average, their quotas being a little more than 1 to 1,500, and the world quota a little more than 1 to 2,000. With increasing charity service and the reduction in preventable disease and increased facilities for mass production in this country, 1 doctor to every

TABLE 2.—*The Number of Doctors in a Few Countries and in Boston in Proportion to Their Respective Population*

Country	One Doctor to a Population of
Persia	40,000
Peru	7,936
Chile	5,076
Mexico	4,237
Poland	3,289
Brazil	2,958
Sweden	2,890
Greece	1,727
France	1,697
Germany	1,552
Japan	1,302
United States	789
Boston	306

2,000 people is a conservative ratio for present-day conditions. The next problem is difficult to solve: Taking a 1 to 2,000 ratio as a standard, how is the number of doctors going to be reduced to this ratio, since at present there is a ratio of 1 to 789? We cannot afford to destroy our surplus. They may starve if conditions do not change. A large number are dying of angina pectoris and apoplexy.

The following suggestion is offered: Require medical colleges to reduce the number of graduates 25 per cent each year until a ratio of 1 doctor to 2,000 of population is reached. This must be done or the practice of medicine must be turned over to the government. The government will employ only a sufficient number to do the work, and continue to employ such numbers regardless of the number graduated each year. When the government offers free service, the sick will take advantage of this offer. What will those of us who are not in the employ of the government do? The answer is simple—We shall of necessity be forced to seek other employment.

From the foregoing facts it is evident that the problems confronting the medical profession today may be summarized as follows:

1. There is a decreasing demand for paid medical service.

2. Preventive measures, increasing charity service and competitive practice of medicine by municipalities, states, the federal government and corporations have reduced paid service by at least 50 per cent.

3. There is an overproduction of medical men.

4. There is a great increase in efficiency and capacity of each individual doctor to render service—one well trained doctor should do the work of two poorly trained ones, and with modern facilities he can do the work of many under the old order of things.

5. The present financial crisis has stimulated the medical man to take stock of his status and analyze the situation in commercial terms and apply the same laws that control supply and demand or production and consumption to his case, thus arriving at the conclusion that the only hope for the medical man is to make the production of doctors in the future conform to the law of supply and demand. This is the only way to control state medicine. This is the only way to compromise with charity service. This is the only way to solve the problem of the high cost of medical care. This is the only way to keep medical men out of the bread line in the future.

478 Peachtree Street.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 10:45 to 10:50 a. m. (central standard time) over Station WBBM (770 kilocycles, or 389.4 meters).

The subjects for the week are as follows:

October 17. The Money Value of a Worker.
October 19. Nose-Bleed.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 10:45 to 11 over Station WBBM.

The subject for the week is as follows:

October 22. Why Have a Health Department?

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Society News.—Speakers before the San Francisco County Medical Society, October 11, were Drs. Emmet Rixford, who discussed a survey of the medical aspects of venereal diseases in San Francisco, and Emile F. Holman, "Partial Pancreatectomy in Chronic Spontaneous Hypoglycemia."——Dr. Abraham Lincoln Desser was among the speakers before the Los Angeles Obstetrical and Gynecological Society, October 11; his subject was "Conservative Treatment of Pelvic Inflammation."——The Los Angeles Surgical Society was addressed, October 14, by Drs. Carl W. Rand and Ernest E. Kessler on "Spasmodic Torticollis" and "Osteomyelitis at the Costochondral Junction," respectively.

The Herzstein Lectures.—Philip Anderson Shaffer, Ph.D., professor of biological chemistry and head of the department, Washington University School of Medicine, St. Louis, will deliver the third series of Herzstein lectures on the general subject "Some Aspects of Carbohydrate Metabolism and Their Bearing on Clinical Problems." Dr. Shaffer will discuss "Blood Sugar: Its Uses and Regulations," "Insulin and Hypoglycemia" and "Ketosis and Metabolism in Diabetes" at the San Francisco County Medical Society's home, November 28, November 30 and December 2. The fourth lecture, December 5, will be on "Biological Oxidation: How Living Cells Burn Fuels" and will be given at the University of California Extension Division. Under the provisions of the will of the late Dr. Morris Herzstein, San Francisco, the Herzstein lectures are held in San Francisco under the auspices of Stanford University and the University of California.

DELAWARE

State Medical Election.—Dr. William H. Speer, Wilmington, was elected president of the Medical Society of Delaware at the recent annual meeting in Lewes. Other officers are Drs. Bruce Barnes, Seaford, and George E. James, Shelbyville, vice presidents; William O. La Motte, Wilmington, secretary, and Samuel C. Rumford, Wilmington, treasurer.

ILLINOIS

Society News.—Dr. William G. Turney, Shelbyville, addressed the Shelby County Medical Society, September 23, on diseases of the gallbladder.——Drs. Francis L. Lederer and Philip A. Halper, Chicago, addressed the DuPage County Medical Society at Wheaton, September 21, on "Otologic Problems in General Practice" and "Ophthalmologic Problems in General Practice," respectively.——The Kane County Medical Society was addressed in Elgin, October 5, by Dr. Max Thorek, Chicago, on "Possibilities in the Reconstruction of the Human Form."——Dr. Ellis Fischel, St. Louis, addressed the Alexander-Pulaski County Medical Society, Cairo, September 30, on treatment of cancer.——The Sangamon County Medical Society heard Dr. Harry L. Alexander, St. Louis, September 29, at Springfield, in a talk on arthritis.

Chicago

Society News.—The Chicago Medical Society will be addressed, October 19, by Dr. Morris Fishbein on "Fads, Quackery and Healing"; Dr. Arthur J. Cramp, "Public Nostrums and Healing," and Mr. Charles A. Bellows, assistant states attorney, "Prosecution of the Quacks." The society will be addressed, November 9, by Drs. Andrew C. Ivy on "Medical Research and Animal Experimentation"; Anton J. Carlson, "Thirst and Hunger," and William A. Evans, "The Human Body and Its Care."

Dr. Adair Appointed Chairman of Department.—Dr. Fred L. Adair, professor of obstetrics and gynecology, School of Medicine, Division of Biological Sciences, University of Chicago, has been appointed chairman of the department to succeed Dr. Joseph B. DeLee, whose appointment expired October 1. Dr. DeLee, who has been chairman since the founding of the department three years ago, has been appointed chief of the obstetric service in Lying-In Hospital. He will retain his professorship of obstetrics and gynecology. Dr. Adair came to the university in 1929 as professor of obstetrics and gynecology from the University of Minnesota School of Medicine.

Cook County Graduate School Incorporated.—The Cook County Graduate School of Medicine in affiliation with the Cook County Hospital was incorporated under the laws of Illinois, September 3, as a corporation, not for pecuniary profit. The object is to maintain a graduate medical school for the advancement of medical, surgical and scientific studies and to engage in research. The school will be located in a three-story fire proof building at 427 South Honore Street. It proposes to provide courses in general medicine, surgery and the specialties, to be of such duration and to include such subjects as will best serve to improve the knowledge and practice of regular graduates of recognized schools of medicine. No instruction will be given to persons who are not regularly licensed practitioners of medicine from recognized medical schools. The initial aim of the school is to organize and systematize immediately the great facilities offered by the material contained in Cook County Hospital, and by the institution of a teaching unit in the hospital to improve the care of the sick. It is also desired that fellowships may be provided for the study of suitable problems. The faculty will include the staff of Cook County Hospital in all its branches. The administration of the school will be in the hands of a board of trustees, who became the incorporators by reason of the power invested in them by the staff of the hospital: Drs. Philip H. Kreuscher, chairman; Raymond W. McNealy, secretary; Aaron Arkin, Thomas C. Galloway, Richard H. Jaffe, William F. Moncrieff, Karl A. Meyer and Frederick Tice, the last two ex officio.

INDIANA

State Medical Election.—Dr. Everett E. Padgett, Indianapolis, was named president-elect of the Indiana State Medical Association at its recent annual meeting in Michigan City. He will assume office, January 1, 1934. The new president of the association, Dr. Joseph H. Weinstein, Terre Haute, will take office, Jan. 1, 1933. Dr. Franklin S. Crockett, La Fayette, is the present incumbent. French Lick was selected as the place for the next annual meeting of the association.

Personal.—Dr. Paul A. Campbell, for several years an assistant on the staff, has been appointed chief of the medical staff of Culver Military Academy, Culver.——Dr. Charles M. White, Clinton, was honored at a meeting of the Vermillion-Parke County Medical Society, September 20, on the occasion of his seventy-ninth birthday.——Dr. Frank W. Cregor, Indianapolis, has been appointed a member of the state board of health, succeeding the late Dr. Amos J. Hostetler, La Grange.

IOWA

Health Exhibit at State Fair.—For the first time, the Iowa State Medical Society had an exhibit at the state fair this year. Space was given by the department of health, and posters illustrated, among other things, the significance to the public of the letters "M.D." and the services offered by the speakers' bureau. Free educational movies were shown each afternoon by the state medical society and the Iowa Tuberculosis Association.

Dr. Miller Goes to Syria.—Dr. George H. Miller, associate professor of theory and practice of medicine, State University of Iowa College of Medicine, Iowa City, has been

appointed dean of the American University of Beirut School of Medicine, Beirut, Syria, the *Diplomate* reports. In addition to his duties as dean, Dr. Miller will also teach and carry on clinical work at the university. The appointment is effective at once. Dr. Edwin St. John Ward, who has been dean for several years, is on leave of absence because of ill health.

Local Society Headquarters.—The Waterloo Medical Society recently erected a meeting place and recreational center, known as Wameso Lodge, which is on a four acre wooded tract overlooking Cedar River, twelve minutes from the business section of Waterloo. The members' wives have formed an auxiliary and hold meetings concurrently with those of the medical society. In 1907, the Waterloo Medical Society entered into a contract with the county board to render all necessary medical services for the poor in the city of Waterloo and the two townships in which it is located for an annual consideration of $600, payable quarterly. This contract has been renewed each subsequent year at an agreed sum. Since no remuneration was given to members of the society as individuals for their care of the poor, it was considered appropriate to erect with a part of this fund a place where the society could hold meetings.

Society News.—The Linn County Medical Society will be addressed, November 10, by Dr. Adolph Sachs, Omaha, Neb., on "Agranulocytic Angina." The society will be addressed, December 8, by Drs. George W. Crile, Cleveland, on "A New Conception of, and a New Method of Treatment for Neurocirculatory Asthenia and Peptic Ulcer."——Dr. Floyd B. Langdon, Des Moines, addressed the Des Moines Academy of Medicine and the Polk County Medical Society, September 21, on "Labor Among Primitive People and in the Higher Animal Kingdom."——At the seventy-ninth annual meeting of the Dubuque County Medical Society, Dubuque, September 15, the program included the following papers: "Diagnosis and Treatment of Postoperative Pulmonary Complications," Dr. Willard Van Hazel, Chicago; "Surgical Treatment of Skull Injuries and Fracture—Dislocations of the Spinal Column," Dr. Loyal Davis, Chicago, and "Diseases of the Coronary Arteries," with animated pictures of the action of the heart in health and disease, Dr. Clayton J. Lundy, Chicago.

MARYLAND

Lead Poisoning from Battery Casings.—Thirty-six cases of lead poisoning were reported to the Baltimore Health Department in September, chiefly among Negro children in whose homes discarded storage battery casings had been used as fuel. According to Baltimore *Health News*, an investigation disclosed that during the recent period of economic depression certain junk dealers had given to poor persons in their vicinity casings of storage batteries after the lead plates had been removed for salvage. Such casings carry on them a considerable deposit of lead. During the winter of 1930-1931 and since that time a large number of Negro families have used these casings as stove fuel, which resulted in intermittent lead poisoning from inhalation. The investigation further brought out that several persons had already developed encephalitis, apparently due to the inhalation of lead. In other cases there was a history of headache, vomiting or dizziness. Roentgen examinations of the wrists were reported as showing in nearly all cases characteristic evidences of lead deposit and a lead line on the gums was also commonly present. Laboratory studies at the health department disclosed (1) that lead salts were deposited on the battery casings secured from the homes under investigation; (2) that on burning the casings produced intense heat and large volumes of smoke, which gave a positive lead test, and (3) that lead was present in soot taken from a stove pipe in a home in which the casings had been burned. Junk dealers are cooperating with the health department in eliminating this unusual source of lead poisoning.

MICHIGAN

Personal.—An honorary degree of master of arts was conferred on Dr. Augustus Warren Crane, Kalamazoo, by the University of Michigan at the eighty-third annual founder's day ceremony at the medical school, September 26.——Dr. La Vern I. Rogers recently observed the twenty-fifth year of his practice in Galesburg.——Dr. Arthur H. Burleson, Olivet, has been made a life member of the Michigan State Medical Society; he has been affiliated with the society for thirty-six years.

Society News.—Dr. Neil I. Bentley, Detroit, addressed the Shiawassee County Medical Society, Owosso, September 7, on "Suppuration of the Middle Ear."——I. Forest Huddleson, D.V.M., of Michigan State College, East Lansing, addressed the Oakland County Medical Society in Pontiac, September 29, on "Undulant Fever."——Speakers before the Ionia-Montcalm Medical Society, September 20, were I. Forest Huddleson, D.V.M., East Lansing, and Dr. Robert A. Alton, Lansing, on undulant fever and present-day management of diabetes, respectively.——Dr. Elisha S. Gurdjian, Detroit, addressed the St. Clair County Medical Society, Port Huron, October 4, on surgery of the brain.——A clinical pathologic conference was presented before the West Side Medical Society, Detroit, October 6, by Dr. Plinn F. Morse; Henry F. Vaughan, Dr.P.H., spoke on "Relation of the Board of Health to the General Practitioner of Medicine."——Malcolm W. Bingay, LL.D., editorial director of the Detroit *Free Press*, was the guest speaker when the Wayne County Medical Society resumed its weekly meetings, October 4.——Dr. Loyal Davis, Chicago, addressed the Calhoun County Medical Society, Battle Creek, September 27, on "Surgery of Intractable Pain."

MINNESOTA

"Divine Healer" Pleads Guilty.—Walter H. Hawkins, aged 60, pleaded guilty to grand larceny in the second degree in the district court at Mantorville, September 23. Following an investigation by the Minnesota State Board of Medical Examiners, Hawkins was arrested at Northfield, August 24, after having received $125 in cash from a woman in Faribault who had been ill. The woman had been persuaded to give Hawkins her money in return for treatment by "divine healing" which he was to administer from Chicago by the "absent treatment" method each evening for six weeks. Hawkins did not return to Chicago and on the expiration of the six weeks with no improvement in the woman's condition, he was placed under arrest. At the time he pleaded guilty, Hawkins had been in the Rice County Jail for thirty days. He was given a one year suspended sentence. He informed the court that he was leaving at once for his home in Chicago. He is licensed as a dentist in Illinois.

MISSOURI

Personal.—Dr. Ernest Sachs, professor of clinical neurologic surgery, Washington University School of Medicine, St. Louis, has been elected a member of the German Academy of Sciences at Halle.

Dr. Mott Retires from Practice.—Announcement has been made of the recent retirement from active practice of Dr. John S. Mott, Kansas City. Dr. Mott is one of the founders of the Kansas City Medical Society which, in 1889, was practically absorbed by the Jackson County society. At the time of his retirement, Dr. Mott presented his medical library to the Jackson County Medical Society, of which he is an honor member.

Society News.—Dr. Thomas Kenneth Brown, St. Louis, among others, was the speaker at the annual dinner of the Buchanan County Medical Society, September 7, on puerperal infections.——Dr. Willard Bartlett presented a motion picture sketch on the life of the physician in the tropics, September 20, before the St. Louis Medical Society. A symposium on theelin was presented before the society, September 27, by Edward A. Doisy, Ph.D., Drs. August A. Werner and William D. Collier.

NEVADA

State Medical Election.—Dr. David A. Smith, Mina, was chosen president-elect and Dr. Ontie Hovenden, McGill, became president of the Nevada State Medical Association at the annual meeting in Reno, September 23. Dr. Horace J. Brown, Reno, is secretary. The next annual session will be held in Las Vegas, Sept. 29-30, 1933.

NEW JERSEY

Hospital News.—Newton Memorial Hospital, Newton, a new institution with accommodations for fifty patients, was recently opened.

Personal.—Mr. James W. Johnson, former president of Johnson and Johnson, manufacturers of surgical supplies, who recently resigned after twenty-two years' service, died, September 2, on the White Star liner *Majestic* while on his way home from a visit to Scotland.

Society News.—Drs. William J. Mallory, Washington, D. C., and Abraham M. Rechtman, Philadelphia, addressed the Atlantic County Medical Society, October 14, on "Medical Aspects of Carcinoma of the Colon" and "Orthopedic Treatment of Infantile Paralysis," respectively.——Dr. John E. James, Philadelphia, addressed the Gloucester County Medical Society, Pitman, September 15, on obstetric problems.

NEW YORK

District Meetings.—Dr. Louis C. Kress, Buffalo, among others, addressed the sixth district branch of the Medical Society of the State of New York, September 27, on malignant diseases of bone.——Drs. James Burns Amberson, Jr., and Maximilian A. Goldzieher, New York, among others, addressed the third district branch of the Medical Society of the State of New York at Liberty, September 21, on "Trends in Modern Treatment of Tuberculosis" and "Endocrinological Problems in General Practice of Medicine," respectively.——The eighth district branch of the Medical Society of the State of New York held its annual meeting at Leroy, October 6. Dr. Charles H. Goodrich, Brooklyn, spoke on medical economics; Drs. Frank H. Lahey, Boston, on "Carcinoma of the Colon and Rectum," and Elliott P. Joslin, Boston, "Lessons from Diabetic Children for Diabetic Adults." Dr. Lewis M. Hurxthal, Boston, showed motion pictures on the mechanism of heart beat and electrocardiography.

New York City

Personal.—Dr. George A. Wyeth has gone to assist in the installation of an electrosurgical unit in the cancer department of the Rudolph Virchow Krankenhaus, Berlin.

Sir Robert Jones Lecture.—Dr. Joel E. Goldthwait, Boston, will deliver the third Sir Robert Jones Lecture at the Hospital for Joint Diseases, October 27, on "Backgrounds and Foregrounds in Orthopedics."

Hospital News.—The Hospital for Ruptured and Crippled recently established a "growth clinic" for diagnosis and treatment of developmental disturbances in infants and children; it will be under the direction of Dr. I. Newton Kugelmass.——The New York Ophthalmic Hospital and Clinic, for many years located at Third Avenue and Twenty-Third Street, opened, October 1, at a new site, 415 East Sixty-Third Street.

Society News.—Detlev W. Bronk, Ph.D., director of the Eldridge Reeves Johnson Foundation for Medical Physics, University of Pennsylvania, Philadelphia, addressed the New York Physical Therapy Society, October 5, on "Relation of Physics to the Medical Sciences."——Dr. Charles Geschickter, Baltimore, addressed the American-Hungarian Medical Association, October 6, on "Fundamental Factors in the Cause of Cancer."

Society of Plastic and Reconstructive Surgery.—The annual meeting of the Society of Plastic and Reconstructive Surgery will be held in New York, October 28-29. All day Friday and Saturday morning will be devoted to dry clinics and round table conferences at various hospitals. A scientific session will be held Friday evening at the New York Academy of Medicine at which the speakers will be Drs. Charles Claoué, Paris, France, on "Technical Considerations in Plastic Surgery of the Breast"; Leo Mayer, "Tendon and Nerve Repair in Injuries to the Hand"; Harold S. Vaughan, "Surgical Treatment of Cleft Palate," and Jacques W. Maliniak, president of the society, "Plastic Surgery as an Organized Specialty and Problems Confronting It." A second scientific session will be held Saturday afternoon at the New York Hospital and Cornell University Medical College; speakers will be Drs. Guilford Allen Robinson, on "Radium as an Adjunct to Plastic Surgery of the Head and Neck"; William W. Carter, "Value of Osteocartilaginous Grafts," and Charles M. Gratz, "Use of Fascia in Reconstructive Surgery." Physicians are invited.

OKLAHOMA

Graduate Lectures on Fractures.—The annual lectures and clinics for graduate physicians sponsored by the extension division of the University of Oklahoma began, October 3, with a series on traumatic surgery. This series will continue for seven weeks over a circuit that includes Oklahoma City, Shawnee, Ada, Pauls Valley, El Reno, Ardmore and Chickasha. Dr. Charles L. Scudder, Boston, was the lecturer for the first week, on "Treatment of Injuries of the Head," and Dr. Arthur E. Bence, Wichita, Kansas, for "Fractures of the Elbow in Children" and "Fractures of the Hip." Speakers for coming weeks are:

Dr. Hiram Winnett Orr, Lincoln, Neb., Treatment of Compound Fractures of the Leg and Ankle Joint.
Dr. William R. Cubbins, Chicago, Unilateral Fractures of the Condyle of the Femur and Tuberosities of the Tibia.
Dr. Frederick J. Gaenslen, Milwaukee, Fractures of the Elbow and Forearm.
Dr. Frank D. Dickson, Kansas City, Diagnosis and Treatment of Osteomyelitis.
Dr. William B. Carrell, Dallas, Texas, Injuries About the Shoulder.

PENNSYLVANIA

Society News.—Drs. Oscar B. Snyder, Greensburg, and Nelson P. Davis, Pittsburgh, addressed the Westmoreland County Medical Society at Greensburg, September 13, on appendicitis and hernia, respectively. Dr. Stephen W. Nealon, Latrobe, among others, addressed the society, October 11, on treatment of eclampsia.——Dr. Matthew T. Moore, Philadelphia, demonstrated the technic of encephalography before a meeting of the Montgomery County Medical Society, Norristown, October 12.

Graduate Study at Danville.—Geisinger Memorial Hospital, Danville, held the first of a series of graduate study courses planned for the winter at the hospital, September 28. Symposiums on pulmonary tuberculosis, allergy and diabetes were presented by members of the staff. Dr. Richard A. Kern, Philadelphia, was a guest speaker on allergy and diabetes and Dr. William Devitt, Allenwood, on tuberculosis. Programs of similar interest will be sponsored by the hospital each month if the response indicates a desire for them on the part of physicians.

Philadelphia

Hospital News.—Plans for a new naval hospital in Philadelphia, for which funds were appropriated in the recent session of Congress, call for a twelve story building to cost $2,250,000. It will contain twenty wards and two floors will be divided into private rooms for officers.

Public Lectures.—Mount Sinai Hospital has begun a series of health talks to acquaint the public with the principles of preventive medicine. They will be given the fourth Wednesday in every month. Dr. Bernard Mann gave the first, September 28, on cancer. Other subjects to be taken up include tuberculosis, heart disease, high blood pressure and kidney disease, diabetes, prenatal care and care of children.

Symposiums on Poliomyelitis.—The College of Physicians of Philadelphia presented a symposium on poliomyelitis at its first meeting, October 5. Dr. J. Norman Henry, director of the department of health, discussed the present outbreak in Philadelphia; Drs. Howard Childs Carpenter and Joseph Stokes, Jr., presented a preliminary report on the use of parents' blood in the present epidemic, and Drs. John R. Paul and James D. Trask, New Haven, Conn., gave a paper on the epidemiology of the disease. Clinical conferences at Misericordia and Northwestern General hospitals were also devoted to the subject, October 4 and 7, respectively.

Appointments at Temple University.—Dr. John A. Kolmer, professor of immunology and chemotherapy, Temple University School of Medicine, has been made head of the department of medicine in a reorganization of the staff announced at the opening of the school, September 28. Dr. Kolmer succeeds Dr. William Egbert Robertson, who resigned from the chair of medicine to pursue his own research. Other recent appointments include: Drs. Edward Weiss as clinical professor of medicine; George Morton Illman and Hugo Roesler, associate professors of medicine; Nathan Blumberg and Edward Steinfield, assistant professors of medicine. Among promotions and changes are Drs. Joseph C. Doane, promoted to clinical professor of medicine; James Kay, associate professor of medicine; and Samuel A. Savitz, associate professor of medicine.

SOUTH CAROLINA

Society News.—Drs. Benton M. Montgomery, Marion, and George H. Bunch, Columbia, among others, addressed the Seventh District Medical Association at Manning, September 15, on "Rocky Mountain Spotted Fever Identified in Marion County" and "Surgical Treatment of Pulmonary Tuberculosis," respectively.——Dr. William B. MacNider, Chapel Hill, N. C., addressed the Greenville County Medical Society, Greenville, September 5, on "The Cytological Basis for Certain Functional States."——Dr. Warren T. Vaughan, Richmond, Va., addressed the Columbia Medical Society, September 12, on "Atypical and Borderline Allergic Reactions as a Factor in General Medicine."

TENNESSEE

Society News.—Dr. Frederick E. Marsh, Chattanooga, addressed the Hamilton County Medical Society, September 29, on the value of psychotherapy in general medicine.——Dr. Shields Abernathy, Memphis, among others, addressed the medical society of Hardin, Lawrence, Lewis, Perry and Wayne counties in Waynesboro, August 30, on surgery of the abdomen.——Dr. Lucius E. Burch addressed the Nashville Academy of Medicine, October 4, on "Sterilization of the Female."

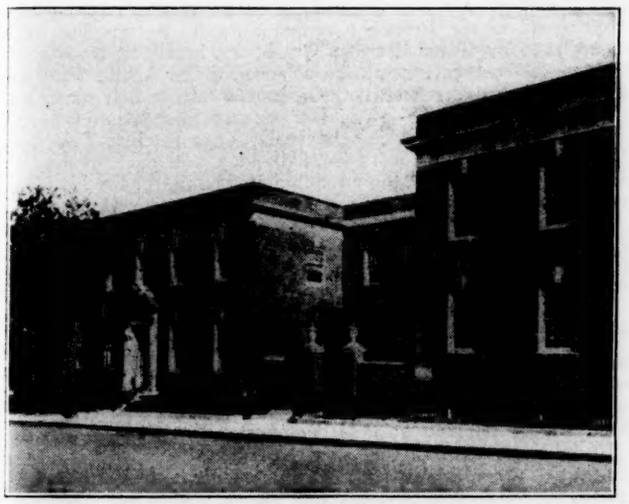
Public Health Meeting. — The Mississippi Valley Public Health Association, which is composed of health officers of western Kentucky and Tennessee, southern Illinois and southeastern Missouri, held its annual meeting at Reelfoot Lake, September 12. Speakers on the program were Drs. Waller S. Leathers, Nashville, on public health education; Frank L. Roberts, Trenton, Tenn., syphilis as a public health problem; John L. Jones, Louisville, immunization against diphtheria, and Wallace P. Moore, Memphis, antimalaria campaigns.

TEXAS

District Meeting. — The annual session of the Mid-West Texas District Medical Association was held in Stamford, September 21-22. Among the speakers were Drs. Everett S. Lain, Oklahoma City, on "Chemical and Electrolytic Lesions of the Mouth Caused by Artificial Dentures"; Clarence M. Grigsby, Dallas, "Cardiac Pain: Its Significance and Treatment"; Truman C. Terrell and Simeon H. Hulsey, Fort Worth, "Infection in Allergy" and Erle D. Sellers, Abilene, "Hay Fever and Pollen Asthma in Mid-West Texas."

VIRGINIA

Richmond Academy in New Home. — The Richmond Academy of Medicine and the library of the Medical College of Virginia have recently taken possession of a new two-unit building which has just been completed near other buildings of the medical college. The joint building is in Georgian architecture with interior furnishings of the same period. The



photograph shows the college library and a part of the academy's home. The academy building was dedicated, September 20, with ceremonies at which Dr. Edward H. Cary, Dallas, Texas, President, American Medical Association, gave an address on "Libraries, the Storehouse for Human Experience," and Dr. Francis R. Packard, Philadelphia, "The Oldest Medical Library in the United States." This building provides room for the Joseph L. Miller collection of books, engravings and curios, presented recently to the academy by Dr. Miller, now of Thomas, W. Va. In addition it contains headquarters for the Medical Society of Virginia. Dr. Stuart McGuire was chairman of the building committee. The college library contains offices, work rooms, reference and reading rooms and seminar rooms in addition to the stacks. During the past year the Carnegie Corporation gave $10,000 for expansion of the general library and $1,600 for the library on dentistry.

WASHINGTON

State Medical Election. — Dr. Alexander H. Peacock, Seattle, was elected president of the Washington State Medical Association at the annual meeting in Tacoma, September 14. Other officers are Drs. James T. Rook, Walla Walla, and William A. Taylor, Ellensburg, vice presidents, and Curtis H. Thomson, Seattle, secretary.

WEST VIRGINIA

Society News. — Dr. William James Gardner, Cleveland, addressed the Ohio County Medical Society, Wheeling, October 7, on surgery of the brain.——Dr. Blonda S. Brake, Clarksburg, addressed the Monongalia County Medical Society, September 6, on urolithiasis.——A symposium on diseases of the gallbladder was presented at a meeting of the Cabell County Medical Society, Huntington, September 8, by Drs. Oscar B. Biern, Robert J. Wilkinson, Robert M. Wylie, Frank C. Hodges and Alexander R. MacKenzie.——Dr. Frank S. Johns, Richmond, Va., addressed the Fayette County Medical Society at Oak Hill, September 20, on mortality in appendicitis. Members of the Kanawha Medical Society were guests at this meeting.

GENERAL

Orthopedic Meeting Postponed.—The Clinical Orthopedic Society will meet in Chicago, January 12-14, instead of November 10-12, as previously planned.

Invitation to Mexican Medical Congress.—The secretary general of the Mexican Medical Association, on the part of the board of directors of that organization, has addressed to the American Medical Association an invitation to attend and take part in the tenth annual National Medical Congress, to be held in Morelia, Michoacan, December 4-11. Dr. Daniel Gurria Urgell is president and Dr. Leopoldo Escobar, secretary general of the association.

Society News.—Louis L. Thurstone, Ph.D., professor of psychology, University of Chicago, was elected president of the American Psychological Association, September 8. The next annual session of the association will be held in Chicago, Sept. 7-13, 1933.——Dr. Nathaniel W. Faxon, Rochester, N. Y., was chosen president-elect of the American Hospital Association at its annual meeting in Detroit, September 12-16.——The National Council of Parent Education will hold its third biennial conference at French Lick, Ind., November 11-12.——The next annual session of the Western Surgical Association will be held in Madison, Wis., December 9-10.

Manufacture of Medicinal Whisky.—The third authorization for the manufacture of medicinal whisky since the enactment of the prohibition law will be made shortly, according to an announcement by James M. Doran, commissioner of industrial alcohol. Two million gallons will be made in the seven or eight distilleries connected with the concentration warehouses. Since less than ten million gallons are now in storage and withdrawals average about one and a half million gallons a year, it will be necessary to manufacture the new supply this year in order that it may be aged for five years before it is used. It is pointed out that a considerable amount is lost by evaporation. Demands for medicinal liquor have fallen off from 25 to 30 per cent this year, the commissioner said. The first authorization for manufacture of medicinal whisky was made in 1929 and the second in 1931.

Hospitalization of Mental Patients.—Results of enumerations of patients in state hospitals for mental disease for 1929 and 1930 were recently announced by the Bureau of the Census. The total number of patients on the books of the 164 state hospitals and two federal hospitals (St. Elizabeth's Hospital, Washington, D. C., and Asylum for Insane Indians, Canton, S. D.) at the end of 1930 was 323,688. This number represents 236.1 persons per hundred thousand of the general population. It was said that the hospitals during 1930 cared for a daily average of 31,422 patients above their normal capacity. During 1930 the hospitals admitted 62,738 patients for the first time and 15,714 who had previously been treated in hospitals for mental disease. Men outnumbered women among first admissions, 144.8 to 100. Dementia praecox was the diagnosis in more than 20 per cent of the new admissions, 13,047 cases in 1930 and 12,187 during 1929. Among readmissions manic-depressive psychosis was the most frequent cause, a situation attributed to the recurrent nature of the disease. There were nearly as many readmissions for this disease as new admissions; the latter amounted to 14 per cent of all new admissions. In 1930, 38,538 patients were discharged: 29.6 per cent as recovered; 45.6 per cent, improved, and 10.9 per cent, unimproved. There were 26,923 deaths of mental patients in state hospitals in 1930, a mortality rate of 89.7 per 1,000 patients under treatment. The cost of operation for 160 hospitals in 1930 was $105,733,982, a per capita cost of $302.64. The personnel included 45,817 officers and employees.

Warning Against Psittacosis.—The U. S. Public Health Service has issued a warning to the public to avoid contact with recently shipped or acquired birds of the parrot family, since several cases of psittacosis have been reported. Five cases with one death have occurred in Minneapolis and a case has been reported from Boise, Idaho. The death of a man in Coloma, Mich., August 30, was attributed to psittacosis after a bird owned by him had been examined at the Rockefeller Institute, New York, and found infected. Interstate quarantine regulations have recently been amended to limit interstate transportation of birds of the parrot family by common carrier

to those certified by the proper health authority of the state as coming from aviaries free from infection. An investigation by the public health service during the present year indicates that the infection of psittacosis is present in some breeding aviaries in California, and it is believed that birds from these sources have been the means of spreading the disease to other states. The cases in Minneapolis and Boise were traced to California parrots or parrakeets. Twelve cases, with six deaths, were reported in California between Dec. 1, 1931, and Feb. 10, 1932. A state-wide investigation has been ordered in Minnesota of all dealers in birds and places where birds have been on exhibition, such as county fairs. Dr. Giles S. Porter, health officer of California, October 7, ordered a quarantine on every bird of the parrot family in the state. Newspapers also reported that a similar ban had been placed in effect in Illinois, prohibiting common carriers in the state from accepting the birds for interstate transportation unless they are accompanied by a certificate from the state health department.

Bequests and Donations.—The following bequests and donations have recently been announced:

Germantown Dispensary and Hospital, Philadelphia, $10,000 to aid patients suffering from cancer, by the will of the late Adeline Butler Murray.

Mount Desert Island Hospital, Bar Harbor, Me., $20,444 by the will of Mrs. Emma Baker Kennedy of New York and Bar Harbor.

Franklin County Public Hospital, Greenfield, Mass., $10,000, and Shriners' Hospital for Crippled Children, Springfield, Mass., $15,000 by the will of Mrs. Ella M. Johnson.

James Whitcomb Riley Hospital for Children, Indianapolis, $5,000 by the will of Mrs. Mary J. Procter.

Germantown Dispensary and Hospital, Philadelphia, one fourth of an estate valued at about $60,000 under the will of the late Dr. John Hedges. The remainder of the estate was left in trust to a brother, on whose death one third of it will go to the University of Pennsylvania in trust to be known as the Dr. John Hedges Memorial Scholarship Fund to provide free attendance in the medical school for boys selected by the trustees.

Stuyvesant Square and Presbyterian Hospitals, New York, and the New York Tuberculosis and Health Association, $11,544 each under the will of the late William V. Creighton.

Children's Hospital, Detroit, $10,000 by the will of Mrs. Adeline Livingstone, Detroit.

Willard Municipal Hospital, Willard, Ohio, $500 by the will of Mrs. William Crowell.

Elizabeth General Hospital and Dispensary, Elizabeth, N. J., $5,000 under the will of Miss Emma C. Boles.

Middlesex General Hospital, New Brunswick, N. J., $5,000 under the will of the late James W. Johnson.

Montefiore and Mount Sinai hospitals, New York, $2,000 each under the will of Mrs. Helen R. Longsdorf.

King's Daughters' Hospital, Columbia, Tenn., $3,000 by the will of W. Andrew Dale.

Havre de Grace Hospital, Havre de Grace, Md., $10,000 by the will of Benjamin Harmon.

The University of Pennsylvania will receive $100,000 and the Philadelphia College of Physicians, $15,000, under the will of the late Dr. Astley P. Cooper Ashhurst; both bequests are effective on the death of Dr. Ashhurst's widow.

Home for Destitute Crippled Children, Chicago, $10,000 by Mr. Martin A. Ryerson.

Good Samaritan Hospital, Sandusky, Ohio, $5,000 under the will of the late Russell K. Ramsey.

PUERTO RICO

Medical Board News.—Dr. Oscar G. Costa-Mandry, San Juan, has been elected secretary of the Board of Medical Examiners of Puerto Rico, succeeding Dr. Alfredo Ortiz Romeu, San Juan. Dr. Costa-Mandry is a new member of the board, replacing Dr. Pablo Morales y Otero, San Juan. The board has recently been admitted to membership in the Federation of Medical Boards of the United States.

Annual Report.—Governor James R. Beverley, in his annual report just submitted to the Secretary of War, said the population of Puerto Rico was 1,599,142, or 465.5 to the square mile, which is said to be too great a concentration for an agricultural area. The Rockefeller Foundation contributed $72,399 during the year for development of health centers. The governor declared that control of malaria is an almost impossible problem. Proper drainage to prevent mosquito breeding has not been achieved nor has an adequate treatment for the disease been found, according to this report. Development of new industries, extensive emigration and limitation of population are pointed out as possible solutions.

FOREIGN

Medals Awarded.—Major David T. Richardson, Royal Army Medical Corps of England, received the Leishman Prize for 1931, a silver medal and a sum of £30, in recognition of his work in the interests of military hygiene. This prize is awarded annually for the best work in any branch of medicine, surgery or an allied science by an officer of the Royal Army Medical or Dental Corps. Dr. Neil McLean of the Colonial Medical Service has recently received the North Persian Forces Memorial Medal for 1931 for a paper on trypanosomiasis (sleeping sickness). This award is made for the best paper on tropical medicine or hygiene during any twelve months by an officer of any of the military medical services.

Society News.—The Chinese Medical Association was to hold its annual general conference in Shanghai, September 28-October 5. The association has recently purchased a lot in Shanghai for the construction of a headquarters building and efforts are being made to collect a building fund. The association has recently published its third directory of Chinese and foreign physicians; the book also contains information on medical schools, hospitals and public health institutions.——The twentieth annual meeting of the Indian Science Congress will be held at Patna, January 2-7. Lieut. Col. Alexander D. Stewart, director, All-India Institute of Hygiene and Public Health, Calcutta, has been appointed president of the section of medical and veterinary research.——The twenty-second congress of the Association of French-Speaking Physicians was held in Paris, October 10-12, under the presidency of Professor Bezançon.——Sir Frederick Gowland Hopkins, professor of biochemistry, University of Cambridge, England, was chosen president of the British Association for the Advancement of Science for the 1933 session, which will be held at Leicester.

Personal.—The secretary of state for Scotland has appointed Dr. James Law Brownlie, Edinburgh, to succeed the late Dr. John Parlane Kinloch as medical officer of health for Scotland. Dr. Brownlie has been a member of the department of health for several years.——The municipal council of Rouen has decided to name a street in honor of Dr. Charles Nicolle, newly appointed professor of medicine in the Collège de France and Nobel prize winner, who is a native of the city.——The gold medal of the French National Surgical Society has been awarded to Professor Leriche, Strasbourg, according to *Science*. The medal has previously been awarded to Sir Victor Horsley, Dr. Henri Gaudier and Dr. George W. Crile. It carries a prize of 5,000 francs.——The Dr. Martini Foundation Prize of Hamburg has been divided between Dr. Otto Fischer, Tübingen, in recognition of his work on pathology and epidemiology in East Africa, and Dr. Helmut Schmidt, Hamburg, for his work on narcosis and anesthesia.——The fourth Italian Congress of Anatomy will be held at Pavia, October 14-17.——The Karl Ludwig Medal, awarded annually in Germany, has been bestowed on Prof. Friedrich Moritz, Cologne, for original work on diseases of the circulation.

Progress of Public Health in China.—When the National Health Administration of China was established, it set out on a program including the establishment of efficient quarantine service, the control of epidemics, the development of administrative principles adapted to local conditions, and provision of facilities for training medical personnel. The *Chinese Medical Journal* notes that, in the three years since this program was instituted, a central hygienic laboratory has been established in Shanghai for control of drugs and "patent medicines," a national pharmacopeia has been published, registration of medical institutions and personnel has been enforced, and supervision of medical practice through local authorities has been introduced. Training for public health officers, sanitary inspectors, midwives and others through short courses is gradually being provided; a midwifery school was opened in Peiping in 1929. In rural areas, five health demonstration stations were set up and the industrial city of Wusih was chosen for an industrial health demonstration field. Nine diseases were made reportable and smallpox vaccination was made compulsory in 1929. In cooperation with the League of Nations the National Quarantine Service was reorganized, and regulations in accord with the International Sanitary Convention of 1926 were promulgated in July, 1931. A "Central Field Health Station" for demonstration of the technical activities of public health, opened in Nanking, May 1, 1931, has investigated epidemics and assisted in flood relief work. Following a survey of medical education made by a representative of the Health Organization of the League of Nations, it was decided to establish an experimental medical school in Nanking to determine by trial the kind of school which would provide the best qualified physicians. A 400-bed hospital which serves as a training center for medical personnel has been in full activity since 1930. Health education of the public receives attention through exhibits, lectures and special courses in health work, conducted by the Central Field Health Station.

Deaths in Other Countries

William Stirling, Fullerian professor of physiology in the Royal Institution, London; author of publications on histologic and physiologic subjects; formerly regius professor of the Institutes of Medicine in the University of Aberdeen, died in Manchester, October 2, aged 81.

Foreign Letters

PARIS

(From Our Regular Correspondent)

Sept. 14, 1932.

Cause of Death in Intestinal Obstruction

Among the theories advanced in explanation of death due to intestinal obstruction, those most commonly defended are intoxication, infection, anhydremia and hypochloridemia. Hypochloridemia is today in favor owing to the surprising results often secured, in cases of intestinal obstruction, from hypodermic injections, or even lavages, of hypertonic solutions of sodium chloride. Dr. Bottin, in an experimental study published in the *Revue de chirurgie*, reviews the theories advanced thus far and shows that they are inadequte to explain the cause of death. If they play a part in the cause of death, it is only through a secondary action. Bottin ascribes the principal rôle to lesions of the pancreas. In support of this he cited the results of his experiments. He demonstrated that early ligation of the pancreatic ducts eliminates the grave phenomena and the lesions of the pancreas. The ligation appears to act by preventing the reflux into the pancreatic ducts of fluids from the distended intestine. In seven cases of intestinal obstruction in man, the pancreas presented, truly enough, lesions comparable to those observed in experiments on dogs. No doubt, the pancreatic lesions, although of paramount importance, do not occur alone. But the other causes act only secondarily, and death may be directly related to acute pancreatitis. This theory, however, does not explain why hypertonic solutions of sodium chloride have such an excellent effect.

The New Laboratory at the Faculté de Pharmacie

The new laboratory created at the Faculté de pharmacie de Paris will be under the direction of Professor Perrot, member of the Academy of Medicine, and will be devoted to research on plant life. The laboratory has been equipped with the aid of a governmental appropriation, together with more than 600,000 francs ($24,000) contributed largely by the alumni of the Ecole de pharmacie and the large manufacturers of pharmaceutic specialties and chemical products. The laboratory was opened by the minister of public instruction at ceremonies attended by the rector of the University of Paris, and by the present dean and former deans of the Faculté de pharmacie. Dr. Perrot, in his address, emphasized that phytotherapy is again coming into favor in France and pointed out the economic interest that France would have in bringing about a better utilization of the opportunities offered for the cultivation of medicinal plants. He stated with regret that France was still importing every year 4 tons of aconite, 21 tons of bardane oil, 3 tons of belladonna, 67 tons of wild poppy, 90 tons of cherry stalk, 1,140 tons of roses and 234 tons of linden-tree flowers, all of which plants are nevertheless common in France.

The Statute of Limitation in Medical Damage Suits

A French statute of limitation (that is to say, a statute fixing the time after which a claimant loses the right to enforce his claim by suit) provides that a damage suit for injuries due to imprudence must be instituted within three years. The limitation provided by statute for theft and murder is much longer. A case has been made public in which the Paris court of appeals rendered a rather surprising decision, which reveals, as has been shown by previous decisions, that the French courts take habitually a malevolent attitude toward physicians. A woman had been operated on, in 1904, at the Hôpital St. Antoine, by the surgeons Monod and Robineau, for a floating kidney, an abscess of the liver and appendicitis. In 1920, another operation became necessary for the extraction of a foreign body from the abdomen, which proved to be a clamp, and in 1927 a third operation (for eventration) followed. The patient brought suit against Dr. Robineau and the heirs of Dr. Monod for the sum of 80,000 francs ($3,200) by way of damages. The counsel for the defense invoked the statute of limitation before the court of appeals, which has now rendered a decision to the effect that the statute of limitation of three years for injuries due to imprudence was not applicable in this case but rather the statute of limitation for pecuniary liability, which runs three years. It would appear, however, evident that the pecuniary liability ceased and determined at the same time as the right to enforce a claim for damage for the alleged initial misdemeanor. In 1931, the court of appeals of Aix had rendered a similar decision, in spite of the learned opinion of Dr. Nast, professor at the Faculté de droit in Strasbourg, who had been consulted.

Institute of Social Hygiene at Tananarive

Governor General Cayla of Madagascar has promulgated a decree establishing at Tananarive an institute of social hygiene, which will combine under a single administration the antivenereal and the antimalarial dispensaries already organized in the colony, to which will be added three new units: the antituberculosis dispensary, the antileprosy dispensary and the dispensary of general and social hygiene. The first four dispensaries are institutions for diagnosis and research. They determine the measures of prophylaxis applicable to venereal disease, tuberculosis, malaria and leprosy, and likewise the most effective therapeutic procedures with which to combat these disorders. They give the necessary technical directions to the dispensaries of hygiene and social medicine. The patients whose condition does not require hospitalization will receive in these institutions free consultations and free treatment. The dispensary of general and social hygiene will be charged with giving instruction in hygiene to the students in the school of medicine at Tananarive, to the midwives and to the nurses who render aid to the native population. It will also train the visiting nurses and the agents for the promotion of hygiene. It will likewise assure, with the aid of films, tracts and posters, an active public campaign with a view to promulgating among the people the most indispensable ideas of hygiene and prophylaxis.

LONDON

(From Our Regular Correspondent)

Sept. 24, 1932.

Food Poisoning a Notifiable Disease

The London County Council has made a new departure in this country with regard to food poisoning, bringing it into line with infectious diseases. Every case must now be reported by the physician to the health officer of his district. Every day the council issues a food poisoning bulletin, which is sent to each of the twenty-eight health officers of London with the object of preventive action. It has been stated that the new law may lead to some difficulty, as there is no exact definition of food poisoning, which may be confounded with digestive troubles of various kinds. It has also been suggested that human "carriers" may play a part in the propagation of the malady.

Silicosis and Asbestosis

The ministry of health has issued an important memorandum on silicosis and asbestosis. The incidence of silicosis continues to be serious and widespread. During the last three years the figures are: workers in ganister mines and silica brickworks, 80 cases and 30 deaths; in sandstone, 179 cases and 25 deaths; in pottery, 322 cases and 87 deaths; in metal industries, including metal grinding and sandblasting, 81 cases and 32 deaths; in coal mines, 91 cases and 20 deaths. When fine silica dust is inhaled many of the particles are caught on the bronchial mucous membrane and are readily removed in the secretion, but those which enter the air sacs cannot be so removed. They

are attacked by phagocytes, which surround and convey them outward to the bronchial tubes or they pass through the walls of the air sacs and move along the lymphatics of the lung. If the quantity of dust is small, the cells can deal with it successfully, but, if excessive, the dust-laden cells will acumulate and give rise to inflammation. Once this process has begun, nothing can stop its progress, and more or less slowly lung is converted into fibrous tissue, at first in nodules, which coalesce into larger areas. When inhaled in injurious amounts, silica dust at first produces no immediate effect, because it does not irritate the nose or throat, but later the fibrosis of the lung produces dyspnea, which may prevent work. Moreover, there is a predisposition to colds, influenza and tuberculosis.

The methods of prevention are as follows: (1) suppression of dust, sometimes accomplished by the use of water; (2) exhaust ventilation; (3) respirators, but these are insufficient against fine dust. Regulations to safeguard against the inhalation of silica dust are now in force for the grinding of metals, the cleaning of castings, the manufacture of tools, the breaking and crushing of material containing silica, and the manufacture of bricks. Mechanical drills for highly silicious rocks must be provided with a means to prevent the escape of dust. In certain industries, initial and periodic medical examinations are now required. The latter enable silicosis to be detected early.

Asbestosis is characterized by a special type of fibrosis of the lungs which resembles silicosis but differs in some of its clinical and pathologic features. It is produced in the breaking, crushing, disintegration or grinding of asbestos. The suppression and control of dust and the other methods are used in the prevention of silicosis. In both conditions compensation is payable for disablement or death.

BERLIN

(From Our Regular Correspondent)

Sept. 5, 1932.

Effects of the Economic Crisis on Nutrition

Prof. Carl von Tyszka, political economist at the University of Hamburg, has collected comprehensive statistics on the influence of the economic crisis on the mode of living and on the nutrition of the German people. It may seem surprising to learn that there has been a greater reduction in expenditures for vegetable foods than for animal food products, which shows the great need felt by families in the city for a generous supply of animal foods. Even with a 30 per cent reduction in income, the consumption of animal products was reduced as little as possible. All those who consider a diet of potatoes and rye bread as better adapted to the industrial population than meat and butter should note this fact. Restriction of the diet should not go beyond certain limits, for definite fat requirements must be satisfied. Tyszka's study shows that with a 30 per cent reduction in income there is impairment of nutrition, which is expressed in a decrease in the quantity of food consumed, a lowering of quality standards, and decrease of the protein intake and of the number of calories. Even among workmen who were still employed, the vitamins in the diet were scarcely adequate, while among the unemployed workmen there was a great dearth of vitamins. This was true of families that received fairly generous unemployment aid. Professor von Tyszka approves of Dr. Hellmut Lehmann's use of the term "veiled famine." The figures obtained show that the nutrition is entirely inadequate because of its greatly reduced percentage of proteins. The article contains some interesting comparisons on the average incomes in certain professions. According to the federal income tax sheets of 1928, the average annual income of lawyers was 18,428 marks ($4,385); of physicians, 12,616 marks ($3,002); of physician-dentists, 7,929 marks ($1,887), and of dentists, 4,201 marks ($1,000). More than half of the lawyers (54.4 per cent) had an income exceeding 12,000 marks ($2,856), while only 7.6 per cent had an income under 3,000 marks ($714). Of the physicians, on the other hand, only 43.5 per cent had an income of more than 12,000 marks ($2,856), and nearly 9 per cent had less than 3,000 marks ($714) annual income. Von Tyszka reaches the following conclusions: If one assumes that an income of 5,000 marks ($1,190) is the lowest amount that will permit a physician to preserve in a measure his standard of living, of the 37,258 physicians covered by the statistics about 29,000 had such an income or even more, although about 3,500 physicians had an income under 3,000 marks ($714). These statistics apply, however, to the year 1928, and, in the last few years, incomes in the professions have declined. It is assumed that the decline amounts to 20 per cent or more. If that is correct there are now not 29,000 but only 23,000 physicians who have an income of more than 5,000 marks ($1,190). These figures show what sacrifices the economic crisis has imposed on the professions. A survey of the salaries of petty officials, as shown in the same article, shows that these officials have had a greater reduction in their salaries than the workmen in their wages. The decline in salaries since 1927 ranges between 19 and 25 per cent. That corresponds approximately to the reduction in the commodity price index. This index, however, takes no account of the advance in the price of luxuries or of increased taxes. The commodity price index is based chiefly on a workman's household and cannot be regarded as applicable to the standard of living of the official or of the professions. A federal inquiry into the mode of living of officials (1927-1928) showed the following living conditions: The expenditures for food in the households of officials have declined 24 per cent. The outlay for rent, heating, lighting, clothing and other required expenditures has decreased only 6.5 per cent, while the expenditures for luxuries have increased 8.6 per cent in cost price. Thus, an average reduction in expenditures of 10 per cent is noted. Over against this there is a reduction in salary of from 19 to 25 per cent. If the official is to balance his budget, the cost of living must be reduced by from 10 to 15 per cent. It is important to see occasionally the actual figures that depict these things that every one experiences personally in order that he may realize what the results will be.

The Kaiserin Auguste-Viktoria-Haus

The mortality of infants and children in Germany has been reduced, in recent years, from 25 per cent to about 8 per cent, a result that can be ascribed to progress in hygiene and to the increasing knowledge of mothers with reference to the care and nutrition of children. The Kaiserin Auguste-Viktoria-Haus in Berlin has performed a great service in disseminating the most important ideas on infant hygiene and in the abolition of superstition and ignorance. This federal institution for combating infant mortality, which is under the direction of Professor Langstein, is not only a model home and hospital for infants and children but assumes also the task of carrying on scientific research. It was erected at a time when of 100 infants 20 or more died in the first year of life. It was recognized even then how important it is to provide the best living conditions for the new-born child. Special rooms are equipped for the care of children born prematurely. In the home for mothers, women without means find a refuge after confinement, until they secure a position or admission to a care-taking institution. In the crèche, or day nursery, employed mothers may leave their young children where they will be well cared for. Entirely separate from the other departments is the ward for infectious diseases. The physicians of the institution have laboratories and a large scientific library for their own use. The consultation center for mothers, which is associated with the "home," and where mothers may bring their children and obtain advice and information, widens the circle of influence of the institution. Through the training of special nurses for the care of infants,

of teachers for the giving of instruction in nepiology, and of nurses to serve in hospitals for infants, the "home" endeavors to promote the welfare of the oncoming generation. All public and private centers in the *reich* that have to do with the protection of infants have the ample equipment of this institution at their disposal.

This home and hospital has of course suffered greatly from the economic depression. Many of the former donors are no longer in a position to make contributions. Prussia has felt compelled to withdraw the subsidy that it had been granting. But, because of the economic distress, this center is more important than ever, for its foremost task is to preserve the strength of the people by protecting the child. In order to be in a position to help as many poor mothers as possible, the administration of the "home" organized a festival in the Zoologischer Garten, the proceeds serving to swell the free bed fund. The federal commission for the promotion of a knowledge of hygiene among the people aided in holding, August 20-22, an instructive exhibition termed "Mother and Child," with which was associated a special exhibit named "Mother and Child in Art," which was followed by a children's festival.

Park Reserved for Nursing Mothers

The municipal council of Berlin is planning to introduce on the south side of Berlin an innovation. In connection with the laying out of the new athletic field in Neukölln, a portion of the park is to be especially arranged and reserved for nursing mothers. Mothers will thus be afforded an opportunity of spending several hours in the fresh air with their children without being subjected to annoyances by strangers. The reservation will be opened some time this year.

PRAGUE

(From Our Regular Correspondent)

Aug. 27, 1932.

The Public Health During 1931

Official figures on the public health situation in Czechoslovakia in 1931, recently published, are of particular interest because during the year there was a severe economic depression. The natural increase of population was less in 1931 than in 1930. This is due to a drop in the birth rate (to 21.5) and to a slight increase in the general mortality (to 14.4). The birth rate has been declining steadily for a good many years and last year's drop is pronounced on account of a decreasing marriage rate resulting from the depression. The year's increase in population amounted to more than 100,000 so that the population of the Czechoslovak Republic attained the figure of about 14,800,000.

As far as infectious diseases are concerned, the situation in 1931 was favorable. This was the fifth year in which there was not a single case of smallpox in the republic. This is due to compulsory vaccination and revaccination, which is being strictly enforced. Typhus fever appears sporadically only in the eastern half of the republic. A few imported cases appeared in Bohemia, but the epidemic focus was quickly eradicated. Typhoid continues to decline, last year's mortality from this disease being the lowest on record (6.5 per hundred thousand). Diphtheria continues to be the most important infectious disease of child life in the country. There was a slight decline as compared with the year 1930 (14.1 per hundred thousand) but the situation is not as favorable as if preventive immunization could be applied on a large scale throughout the country. Scarlet fever continues as a very mild disease. Its death rate (3.6 per hundred thousand) compares favorably with whooping cough (6.7) and measles (4.7). Infantile paralysis was rare in the country for a good many years. The first epidemic appeared in 1928. The following years showed a low incidence of cases, but last year registered an epidemic of 343 cases. This disease represents a permanent addition to serious public health problems. Influenza appeared in 1931 in a slight epidemic wave which ran through the eastern part of the country.

The most serious feature of the public health picture in 1931 is the rise of tuberculosis mortality. The rapid decline since the end of the World War was interrupted for the first time in 1931. The tuberculosis mortality rose from 161.5 to 167.8. As there was no slackening in public health activities directed against this disease, it seems that this rise is due to a general impairment of the standard of living on account of widespread unemployment. Infant mortality for the country as a whole continues to decline and attained the lowest figure on record in this country (134). Nevertheless, as compared with the previous years, there appears a continual slowing down in the rate of decline. Mortality due to the puerperal state was the same in 1931 as in 1930 (4.1). The number of deaths attributed to malignant tumors continues to rise steadily. For the country as a whole it attained a rate of 116.8 per hundred thousand. In the western part of the country the number of deaths attributed to this cause attained almost the number of deaths caused by tuberculosis.

It can be said on the whole that the economic depression left pronounced traces on the public health in 1931. The most serious one is the increase of tuberculosis mortality and the slowing down in the decline of the infant mortality. But if this impairment in the public health is compared with conditions during the first year of the World War, it is far smaller than that registered in 1915.

The House of Physicians

The first report of the School of Popular Health Education of Prague was recently published. This school is an integral part of the House of Physicians, which was opened in 1930. It was built by the combined organizations of physicians of Czechoslovakia and it houses all the important national agencies of medical practitioners (secretarial offices, editorial offices of medical periodicals, library, medical book store). Last year the idea appeared that the facilities of the establishment would be used for the health education of the general public. The organizers of the undertaking had also the idea that a public health propaganda which would be carried out in the House of Physicians would work back on the medical practitioners and influence favorably their attitude to the public health movement. The experience of the first year as shown in the report was highly favorable. For all the activities of the school the lecture room of the house was used, and, in addition, one of the stores arranged to install public health exhibits. During the first year five series of courses were given. The first course was concerned with the campaign against venereal diseases and with sex education. Independent series of lectures were organized for parents, teachers, adolescents, the army and the working population. Entrance was free both to the lecturers and to the public health exhibits. The second series of lectures was on rheumatism. Again separated groups were organized for those who are most exposed to the disease (railroad employees, workmen in the building trades). The third course was given on cancer. There were two more courses, one of them on infant and prenatal care and the last one organized under the auspices of the Ministry of Public Health and Physical Education on balneology and physical culture. It is estimated in the report that about 20,000 people attended the lectures and visited the exhibits. The success of this undertaking is ascribed to the fact that it is backed by influential leaders (the opening lecture was presented by the dean of the Czech Medical Faculty of Prague), that the premises are located in the center of the city, and that the school succeeded in applying public health topics to the daily life of the public.

The School Movement

The Sokol congress, which was held in Prague in July, had several interesting medical features. This congress, which is

held in Prague every six years, had a special interest as it fell on the hundredth anniversary of the birth of the founder of the movement (Miroslav Tyrs). The Sokol movement in Czechoslovakia has a membership of more than half a million active members. It is organized in gymnastic clubs, which can be found even in the smallest villages. The congress in July attracted to Prague about 500,000 people. At the stadium, 17,000 Sokols appeared at one time in a mass performance. Such an occasion presented serious public health problems, which were well taken care of by the medical section of the organization. The president of the organization is a medical man (Stanislav Bukovsky), who was elected recently. The medical section of the organization made the sanitary arrangements in the stadium and in the improvised living accommodations of the visitors, and it organized an efficient first aid service, which was highly effective during the mass performances in the hottest season of the year. This occasion was also utilized for research by a special group, which examined the gymnasts before and after the performance. The spectacular success of the congress visualized to the public how important a part the Sokol movement plays in the general improvement of the physical status of the population, because it includes in its program the popularization of gymnastics and tries to create facilities for all forms of sports, inducing its members to live hygienically and to have periodic medical examinations.

The Slavic Medical Congress

The Congress of Slavic Medical Students was held in Prague, June 28-30. The congress was established by the Federation of Slavic Medical Students, which was organized two years ago. The congress was attended by the representatives of Yugoslav, Bulgarian, Polish, Ukrainian, Russian and Czechoslovakian medical students. It was held under the auspices of the dean of the Czech Medical Faculty in Prague. The congress dealt with the history of the Slavic movement in medical work and the changing social conditions surrounding medical practice in Europe. Resolutions were passed in favor of the interchange of professors, assistants and students among the medical faculties of Slavic nations represented in the congress. All negotiations were conducted in the native languages of the speakers and only on rare occasions was it necessary to interpret the contents of the subject in another language than the one in which it was given.

The Needs of the Medical Curriculum

The reform of the medical curriculum stands in the forefront of the interest of the medical profession of Czechoslovakia. The four medical faculties of the country have elaborated proposals for the reform which were recently presented to the Ministry of Public Instruction. The reform is also a topic of discussion in medical organizations. Recently a special committee on education was appointed in the organization which concerns itself with rationalization and normalization in medical practice. This committee gave initiative to a debating assembly, which aroused considerable interest. Three papers were presented. The first was read by a country medical practitioner, who pointed out the defects of the present medical education as it presented itself to him when he started practicing. He sees the chief defect of the curriculum in the fact that it did not pay account to the change that has come about in medical practice through widespread sickness insurance. He sees a great drawback in the fact that there is not sufficient opportunity for practical education of physicians before they are allowed to establish themselves in practice. A second speaker spoke as a representative of dispensary physicians. According to the present status, most of the practicing physicians today have some connection with public authorities, many of them being employed on part time in infant welfare clinics, tuberculosis dispensaries, prenatal consultations and school medical inspection. It appears desirable, therefore, that thorough grounding in public health practice should be given to all physicians before they establish themselves in private practice. The paper on the third topic of the program, the point of view of a scientific worker, dealt favorably of the preparation for the scientific career which is given to young medical students at the present medical faculties of the country in comparison with other states in Europe.

In the discussion that followed the reading of the papers, it was generally admitted that the medical curriculum should be modified, but it was recognized that the change of the picture in medical practice was so rapid that the medical faculties did not have enough time to adapt themselves to the present situation. It was also pointed out that apart from medical faculties other institutions will have to be created to take care of the preparation of physicians in special lines of medical service, such as medical insurance, public health service and dispensaries. Nevertheless the medical curriculum should continue to give a sound scientific basis on which the later practical experience can be built up. There was a general agreement that a practical year should be made compulsory for those who have obtained the medical diploma before they are allowed to go into private practice. One of the chief difficulties of the faculties is the overcrowding of teaching institutions, which is caused partly by the presence of foreign students from surrounding states and also by the popularity of medical study among the young generation.

MOSCOW

(From Our Regular Correspondent)

Sept. 9, 1932.

Campaign Against Malaria

One of the principal questions studied at the All-Union conference for planning public health in the second five year plan at Moscow in May was the problem of complete eradication of malaria. In 1923 the number of new malaria cases in the Soviet Union was about four million. In 1930, as a result of curative and preventive measures that were taken, about one million persons fell ill with malaria. Until the present time malaria has chiefly been fought by curative measures. Such measures as pouring petroleum over water supplies, tanks and wells, and spraying swamps with paris green, were not in general use because of lack of material. The growth of the oil industry and the increase in the amount of land under cultivation have a positive influence on the decrease of malaria. Nevertheless, curative work in malaria areas will continue to be of great importance. In localities where there are more than 500 cases of malaria among every 10,000 inhabitants there will be created special malaria prevention stations.

A scientific study aiming to substitute plasmochin for imported quinine has been in progress for some years. New preparations of the type of plasmochin were made and have been tested at the state tropical institute for two years. In 1932 about 100,000 patients will be treated with these preparations, and in 1933 plasmochin will be prepared in sufficient quantity to fill all demands.

An essential help in antimalaria work is the building of sanitary houses which have no dark corners and by the endeavor by the People's Commissariat for Agriculture to destroy the places where the anopheles larvae hatch. Special antimalaria legislation will soon appear. One of its chief points is the obligatory destruction of all unnecessary water reservoirs located within 5 kilometers of populated districts. With the reduction in cost of chemicals, the spraying of chemical substances from airplanes will be continued on a greater scale than at present. Gambusia affinis is a small fish which spawns rapidly in a warm climate; it feeds on mosquito larvae. The Batoum swamps in the Caucasus were sources of malaria in 1930. After Gambusia was cultivated in the swamps, the anopheles mosquitoes vanished.

A detailed registration of malaria patients will be made and completed early in 1934. While infected, every patient will be isolated in a special tent received from the Commissariat of Public Health. As a result of these measures, the malaria morbidity is certain to decrease: 30 per cent in 1934, 50 per cent in 1935, 75 per cent in 1936, with complete disappearance in 1937.

Protection of Childhood

The mortality of children in the Union of Socialist Soviet Republics, as compared with prerevolutionary Russia, has diminished. This is especially evident in towns where there are consultations, nurseries and clinics. In 1928 in Leningrad the mortality of children was 13.7 per cent; in Moscow, 12.8 per cent. In 1931 in Leningrad, Moscow and Kharkov it had decreased.

The number of public nurseries grows every year, as indicated in the following table:

Number of Beds in Public Nurseries (in Thousands)

	1927-1928	1931	1932	Proposed by the First Five Year Plan
Town	34	128.7	263.1	65.0
Country	2.5	102.8	329.4	....
Summer public nurseries	100.5	1,426.3	3,506.0	225.4

It was proposed by the first five year plan to increase the number of beds in public nurseries in industrial districts from 35 to 58.8 for every thousand women. As a matter of fact, in the beginning of 1932 for every thousand women there were 67 places in public nurseries; by the end of the year the number of beds will be increased to 120.

The growth of the number of women in industry, as well as the number of women raising their educational level, and the growing significance of women in social life resulted in infants and small children spending much more time in public nurseries. In the Moscow region 60 per cent of these nurseries are functioning from eleven to fourteen hours daily; in the Nizhni Novgorod region 64 per cent, and in the Far West region 90 per cent. There are also public nurseries where children stay all day.

Protection of Child Health

	1927-1928	1931	1932	1931-1932 (Proposed by the Plan)	Percentage of Overfulfilling of the Plan
Pediatricians	1,730	2,166	3,223	2,600	186.3
Ambulatories for children	183	280	.....	250	112.0
Special beds for children	5,800	13,315	23,540	16,700	405.8

The results in the protection of childhood are due to the attention paid to this question by the public and the government. However, the problem of completely embracing children by public nurseries, ambulatories, consultations and qualified medical help is still before the Soviet public organizations and the Commissariat of Public Health.

Curative Nutrition in Industry

To give workers an opportunity to treat their diseases without stopping their work is the aim of curative nutrition. The nourishment schemes, carefully worked out in the clinics of the Scientific Institute of Public Nutrition, on the base of modern scientific investigations, are used for large numbers of workers. Of 2,000 workers receiving curative nutrition from the factory eating-houses, 90 per cent were benefited.

The Scientific Conference on totals of one year's work in the field of curative nutrition, held at the "Sickle and Hammer" plant, demonstrated the lively interest of workers in this question. Following the example of Moscow, giant mills in other towns are organizing curative nutrition for their workers. This enterprise is wholly supported by public opinion. Thus, the reality and benefit of the enterprise of the Institute of Public Nutrition is evident.

BUDAPEST

(From Our Regular Correspondent)

Sept. 1, 1932.

Typhus Fever and Plague in Central Europe

Dr. Dezsö Horvath, physician-in-chief at the National Public Hygiene Institution, has prepared a treatise on the spread of exotic diseases in central Europe since the armistice. In respect to typhus fever, he states that formerly this disease was called "morbus hungaricus," which is but natural since Hungary has been the battle ground of wars through several centuries. Where war is there is misery, overcrowding and lack of cleanliness, and misery and dirt are constantly followed by typhus. The four infectious diseases that follow wars—cholera, plague, smallpox and typhus—have claimed more lives than the wars themselves. The fact that from 1350 to 1700 Europe's population increased only from 100,100,000 to 110,000,000 is mainly due to infectious diseases, which raged in the wake of wars.

The Serbian epidemic of 1915 claimed 135,000 lives out of 2,500,000 men, and according to reliable records every fifth man contracted the disease. In the years 1919 to 1922 in Russia about 10,000,000 men contracted typhus. In Russia in the period from 1914 to 1922 about 60 per cent of the physicians succumbed to typhus. In 1928 a French cruiser went in search of Amundsen, and when returning it touched Reykjavik (a notorious typhus nest), and a few weeks later typhus broke out on board this cruiser. Typhus fever is not indigenous in the tropics; its nests are in the temperate and rather cold zones. In 1928 there were 1,964 cases in Asia, 2,735 in Africa and 35,009 in Europe. The chief outbreaks were Russia and Poland, where the climate is rather cold and where a considerable part of the population live under primitive conditions, often not taking heed of cleanliness. They wear fur-lined garments, thus providing the best possibilities for the propagation of the carrier of typhus, the louse. The disease attacked from 50,000 to 80,000 persons annually in Russia, prior to the war and revolution. The epidemics of the Soviet times were of frightful proportions even in comparison with prewar Russia. In 1919 more than 2,300,000 and in 1920 nearly 4,000,000 persons contracted typhus fever.

In the figures relating to Poland, the morbidity rate per hundred thousand of population has been from a third to a sixth that of Russia since 1919. Typhus was not rare in Rumania prior to the war, but in the war years it was not common. The total number of cases was 400 in 1915 and 800 in 1916. In the two years following the war the figures rose. The epidemic in 1919 amounted to 56,000 and in 1920 to 46,000 cases. In 1928, only 950 cases were reported.

In Lithuania, a country that was cut off from Russia, the morbidity rate shows fluctuations similar to those of Rumania. In Esthonia in 1919 the morbidity rate was 100 per hundred thousand of population; in 1920 it was 400, but since 1923 the rate has fallen rapidly and in 1928 not one case was reported. In Greece, typhus was endemic before the war. During the war between Greece and Turkey and following the influx of Greek refugees from Turkey, the disease broke out. The morbidity rate was 117 per hundred thousand in 1923 and only 4.1 in 1924. The drop has been continuous. In Czechoslovakia isolated cases occurred prior to the war, but from 1915 to 1918 there were epidemics. Germany learned to know typhus during the war, for since 1885 not 100 deaths a year had occurred until 1915. The annual mortality did not amount to 700 deaths even in the period of 1915-1919. Italy has harbored typhus for decades. Up to 1890 there occurred from 2,000 to 3,000 cases yearly. From 1905 to 1918 the morbidity fell under 50. In 1919 only 635 cases were recorded, but in the camps of Austrian and Hungarian prisoners there were 5,416 cases. Switzerland

has not had a single death from typhus since 1904. As regards Hungary, it has to be admitted that as late as 1929 four cases were recorded. Despite the efforts of the public authorities, the extinction of the disease cannot be expected as long as vagrant gipsies are not under satisfactory control.

As regards plague, there are places in Europe where sporadic cases occur. Such are the Azore islands, which recorded 27 cases in 1928 and 4 in 1929; Greece, 29 in 1928 and 7 in 1929; Italy, 2 cases in 1928; Russia, 32 in 1928 and 41 in 1929. In Hungary not one case has occurred since 1823.

Cholera, since the termination of the war, has evaded Europe. In 1928-1929 not a single case was notified in the whole of Europe. In Hungary there occurred an epidemic in the Csallóköz in 1911 claiming 252 lives, and one in 1913 in Bacs County with 344 deaths. During the war it was introduced several times, mainly from the Russian front. Since 1918, no cases have been recorded in Hungary.

In regard to smallpox, in the postwar years in Hungary, 144 cases were notified in 1920 with 29 fatalities, but since 1927 not a case has occurred. Since the revaccination law was passed in 1887, it has been enforced rigorously. In Hungary, antivaccinationists are unknown and about 90 to 95 per cent of the infants are vaccinated. Where even sporadic cases occur, the population of the whole region is revaccinated by specially appointed physicians paid by the state. Recurrent fever was formerly unknown in Hungary. During the war it was introduced, but in only a few places, chiefly in hospitals and prisoners' camps. In Europe, recurrent fever is unimportant with the exception of one country, Russia.

JAPAN

(From Our Regular Correspondent)

Aug. 3, 1932.

The New Cancer Institute

A cancer research institute has been established in Tokyo, in the Imperial University Medical Department. The institute is to have a research department and a hospital, and Professor Nagayo of the university is to be the director. After 1933, the government will bear a part of the expense, for this work is regarded as most important.

Cholera in Shanghai

According to the report by Dr. Wulien-Teh there occurred in Shanghai, during the week ended July 16, 318 new cases with 16 deaths among the Chinese, and 4 cases with 1 death among the foreign residents. The total number of cases in the first outbreak was 1,655, with 98 deaths; 24 cases and 8 deaths occurred among the foreign residents. For the week ended July 23, 411 new cases and 36 deaths were reported, bringing the total number of cases among the natives to 2,066.

Regulating Fees

A body of local physicians has requested the Japanese Medical Association to abolish the regulation of the physician's fee, whereby it has restricted its members. Owing to the depression, many people go to a "cost" clinic, against which ordinary physicians cannot defend themselves. The Japanese Medical Association held that to abolish the restriction would be dangerous, because it would tend to create keen competition among the members, which would degrade physicians and endanger the national health. In the conference of the local health officers recently held at the home department, the government informally stated that the regulations of the association are not compulsory. Some are of the opinion that the regulations of the association are contrary to the state constitution. Thus the abolishment of the regulations is deemed to be a matter of time. Every week, the medical journals of this country have their pages filled with articles, asking the opinions of veteran practitioners on how to change the association regulations.

Births and Deaths in 1931

According to a report of the statistical bureau, the total number of births in 1931 was 2,102,006. Thus about 240 babies on an average were born each hour. There was an increase of 18,015, compared with the births in the previous year. The birth rate per thousand of population was 32.16. The deaths in 1931 totaled 1,240,472, or about 142 an hour, an increase of 69,073. The rate per thousand of population was 18.98. Therefore the natural increase in the population was 861,534.

Lack of Medical Equipment in Villages

The death rate of farm villagers in this country is higher than that of dwellers in cities in spite of the fresh air and sunshine. Insanitary conditions, want of proper food, and shortage of medical care are among the causes of this fact. Especially do country people suffer from parasites. A report of the examination of more than 130,000 persons in 71 villages showed that 72 per cent of the residents had parasites. Unemployed factory girls go back to their native villages and distribute city diseases among the villagers, who have little power of resistance to those diseases. In such conditions the medical equipment is inadequate. More than 3,200 villages are said to have no doctor at all. In a recent conference of the prefectural governors, they affirmed that the destitution of the country villages was mainly due to the prevalence of infectious diseases and the want of nutrition. The emperor, who heard of those conditions in the villages, granted funds for medical relief. The government is also going to make an expenditure of 600,000 yen for the same purpose.

Act to Prevent Parasitic Disease

A new act went into effect, August 1, to prevent parasitic diseases. The new act gives the local office the right to execute a medical examination at any time, if need be. One sixth of the whole expense for it will be borne by the government.

The Severance Medical School in Chosen

The proprietor of the Severance Medical School at Seoul, Chosen, has applied to the minister of education of the Japanese government to promote the status of the school to that of the collegiate course so as to obtain sanction for granting licenses to graduates to practice medicine. This school was established for religious purposes and did not give systematic medical education. The commissioners are said to have gone there to investigate the school under the charge of Dr. Hayashi, dean of the Tokyo Imperial University Medical Department.

Marriages

FRED WILSON GRAHAM, Morris, Ill., to Miss Clara Ellen Russell of Terre Haute, Ind., in Chicago, September 3.

JOHN THORPE METCALF, Jersey City, N. J., to Miss Dell Catherine Fleming of Richmond, Va., August 5.

EUGENE CUSHMAN WYLIE, Boston, to Miss Elizabeth Anne McKelvie of Rochester, N. Y., August 22.

WILLIAM E. TOMLINSON, JR., to Miss Margaret Corinne Peaco, both of Richmond, Va., recently.

HAROLD JAMES SCHILLING, Platteville, Wis., to Miss Evalyn Roberta Hurlbut of Chicago, October 3.

JOHNSON MCGUIRE to Miss Elizabeth Eton Livingood, both of Cincinnati, at Quebec, June 5.

ROBERT MONTFORT SCHLEY to DR. MARGARET WARWICK, both of Buffalo, September 19.

BLANTON L. HILLSMAN to Miss Evelyn E. Holdcroft, both of Richmond, Va., July 26.

LEO J. MORIARITY to Miss Leila Gerhardt, both of Two Rivers, Wis., September 8.

EUGENE P. BOWERS to Miss Receda Herman, both of Vincennes, Ind., September 3.

Deaths

John Oscar Skinner ⊕ Lieutenant Colonel, U. S. Army, retired, Washington, D. C.; University of Maryland School of Medicine, Baltimore, 1866; University of Pennsylvania School of Medicine, Philadelphia, 1867; entered the army as an assistant surgeon in 1874; retired in 1893; was again in active duty in 1918 and was retired as a lieutenant colonel in 1930 for disability in line of duty; for many years medical superintendent of the Columbia Hospital; aged 87; died, September 12, in St. Elizabeth's Hospital.

Thomas Oscar Freeman ⊕ Mattoon, Ill.; Baltimore Medical College, 1898; member of the House of Delegates of the American Medical Association, 1916-1917 and 1921-1932; fellow of the American College of Surgeons; formerly member of the state board of health; city health officer; for many years attending physician to the Odd Fellows' Home; one of the organizers and on the staff of the Methodist Memorial Hospital; aged 59; died, October 7, of cerebral hemorrhage.

Walter Francis Tolson ⊕ Major, M. C., U. S. Army, Silver Springs, Md.; Georgetown University School of Medicine, Washington, D. C., 1916; served during the World War; was appointed first lieutenant in the medical corps of the regular army in 1918 and in 1930 was promoted to major; was last stationed at Fort Ethan Allen, Vt.; aged 40; died, September 9, at the Walter Reed General Hospital, Washington, D. C., of pulmonary tuberculosis.

Fitch Champlin Edmonds Mattison ⊕ Pasadena, Calif.; College of Physicians and Surgeons of Chicago, 1888; member of the House of Delegates of the American Medical Association, 1930-1932; fellow of the American College of Surgeons; surgeon to the Pasadena Hospital; chairman of the staff and medical board of the Los Angeles General Hospital; aged 71; died, September 16, of cerebral thrombosis.

Evander M. Sanders ⊕ Nashville, Tenn.; Medical Department, University of Tennessee, Nashville, 1906; member of the Western Surgical Association and the Associated Anesthetists of the United States and Canada; formerly adjunct professor of abdominal surgery and gynecology at his alma mater; aged 56; on the staff of the Protestant Hospital, where he died, June 30, of perforated duodenal ulcer.

Thomas George Lee, Babson Park, Fla.; University of Pennsylvania School of Medicine, Philadelphia, 1886; member of the Minnesota State Medical Association and the American Association of Anatomists; professor emeritus of anatomy, University of Minnesota Medical School, and the graduate school of medicine; aged 71; died, September 1, of injuries received in an automobile accident.

Julius Adams Johnson ⊕ Major, M. C., U. S. Army, Jackson, Tenn.; Vanderbilt University School of Medicine, Nashville, 1916; served during the World War; was appointed a captain in the medical corps of the regular army in 1920 and promoted major in 1929; aged 43; died, September 9, at Fort McClellan, Anniston, Ala., of a self-inflicted bullet wound.

Noah Riley Jackson ⊕ Austin, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1915; president of the Texas Dermatological Association; served during the World War; on the staffs of the Seton Infirmary, St. David's Hospital and the Breckenridge Hospital; aged 46; died, July 30, of pneumonia following an operation.

Joseph Charles Taylor, New York; Columbia University College of Physicians and Surgeons, New York, 1896; emeritus professor of gynecology, New York Polyclinic Medical School and Hospital; formerly on the staffs of the Woman's Hospital, New York, and the Torrington (Conn.) Hospital; aged 60; died, June 19, in Portland, N. Y.

Joseph Uriah Blose ⊕ Altoona, Pa.; Columbus Medical College, 1880; Ohio Medical University, Columbus, 1895; past president of the Blair County Medical Society; member of the city board of health; on the staffs of the Altoona Hospital and the Mercy Hospital; aged 76; died in September, of cerebral hemorrhage.

Henry C. Schoepfle ⊕ Sandusky, Ohio; University of Michigan Medical School, Ann Arbor, 1897; Spanish-American War veteran; for many years county coroner and city health commissioner; on the staffs of the Providence and Good Samaritan hospitals; aged 57; died, September 13, of myocarditis.

Will Howard Swan, Colorado Springs, Colo.; Harvard University Medical School, Boston, 1891; member of the Colorado State Medical Society, and the American Climatological and Clinical Association; aged 64; died, September 5, of bronchiectasis and brain abscess.

Thomas Edward Quigley ⊕ Geneva, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1918; past president of the Ontario County Medical Society; on the staff of the Geneva General Hospital; aged 39; died, August 20, of acute encephalitis.

Murdoch Campbell Smith, Lynn, Mass.; Howard University School of Medicine, Washington, D. C., 1888; an affiliate Fellow of the American Medical Association; also a dentist; formerly on the staff of the Union Hospital; aged 76; died, August 29, of arteriosclerosis.

Jasper Grimes ⊕ Beaumont, Texas; Memphis (Tenn.) Hospital Medical College, 1904; on the staffs of the Hotel Dieu Hospital and the Beaumont General Hospital; aged 59; was killed, September 25, when the automobile in which he was driving was struck by a train.

James Elmer Woelfle, Cairo, Ill.; St. Louis College of Physicians and Surgeons, 1897; member of the Illinois State Medical Society; served during the World War; for many years member of the board of education; aged 60; died, September 9, of angina pectoris.

Everett Eugene Richardson, Ames, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1895; member of the Radiological Society of North America; aged 63; died, August 20, in a local hospital, of diabetes mellitus and cholecystitis.

Arlon H. Gifford, Kalamazoo, Mich.; Detroit College of Medicine, 1904; member of the Michigan State Medical Society; aged 62; on the staff of the Borgess Hospital, where he died, September 11, of carcinoma of the stomach with metastasis to the liver and pancreas.

Frank Benneville Pierce, Haverhill, Mass.; Medical Department of the University of the City of New York, 1886; member of the Massachusetts Medical Society; aged 74; died, September 1, in the Benson Hospital of hypertrophy of the prostate and uremia.

Robert Archie Crawford ⊕ Chamberlain, S. D.; University of Illinois College of Medicine, Chicago, 1913; fellow of the American College of Surgeons; surgeon to the Chamberlain Sanitarium and Hospital; aged 44; died in April, of miliary tuberculosis.

Robert Newton Manley, Clarksville, Ark.; University of Arkansas School of Medicine, Little Rock, 1912; member of the Arkansas Medical Society; served during the World War; aged 48; died, August 27, in Ponaford, Minn., of coronary occlusion.

Harry Hrand Migerdich Malejan, Detroit; University of Michigan Medical School, Ann Arbor, 1914; served during the World War; formerly instructor in surgery at his alma mater; aged 45; died, September 12, of uremia and hypertension.

Charles Irville Prescott, Maplewood, N. J.; Columbia University College of Physicians and Surgeons, New York, 1905; aged 53; died, September 1, in the Orange Memorial Hospital, Orange, following an operation for appendicitis.

Peleg Benson Wing, San Diego, Calif.; Medical School of Maine, Portland, 1883; fellow of the American College of Surgeons; aged 72; on the staff of the Mercy Hospital, where he died, August 12, of chronic pulmonary tuberculosis.

Fred Dexter Haston, Jasper, Ala.; Medical Department, University of Tennessee, Nashville, 1907; member of the Medical Association of the State of Alabama; on the staff of the Walker County Hospital; aged 51; died, August 30.

Joseph Smyser Hay ⊕ Perth Amboy, N. J.; University of the South Medical Department, Sewanee, Tenn., 1899; aged 59; on the staff of the Perth Amboy General Hospital, where he died, June 8, of chronic nephritis and myocarditis.

Edward Henry Schild ⊕ Canton, Ohio; University of Maryland School of Medicine, Baltimore, 1900; member of the American Academy of Ophthalmology and Oto-Laryngology; aged 65; died, September 3, of angina pectoris.

Frank Lewis Newburg, Toledo, Ohio; Toledo Medical College, 1903; member of the Ohio State Medical Association; aged 68; died, August 13, in the U. S. Marine Hospital, Cleveland, of bronchopneumonia and arteriosclerosis.

Raymond Lynde Wadhams ⊕ Wilkes-Barre, Pa.; Columbia University College of Physicians and Surgeons, 1899; served during the World War; on the staff of the Wilkes-Barre General Hospital; aged 59; died, September 5.

Harry Watson Squibb ⊕ Safford, Ariz.; Washington University School of Medicine, St. Louis, 1915; secretary of the Graham County Medical Society; director of the Morris-Squibb Hospital; aged 43; died, August 7.

Lomax Plater Tayloe, Vienna, Va.; Medical College of Virginia, Richmond, 1912; member of the Medical Society of Virginia; served during the World War; aged 54; died, September 12, of cerebral hemorrhage.

Edgar Allen Arthur, Stockton, Calif.; Medical Department of the University of California, 1901; member of the California Medical Association; aged 68; died, July 12, of chronic myocarditis and arteriosclerosis.

Hugh R. Tarver, Guyton, Ga.; University of Georgia Medical Department, Augusta, 1890; member of the Medical Association of Georgia; member of the board of education; aged 63; died, August 25.

Fritz Neumann ✠ New York; German University of Prague Faculty of Medicine, 1897; on the staff of the Lenox Hill Hospital; aged 62; died, August 28, in the Mount Zion Hospital, San Francisco.

Francis Joseph Roberts, San Francisco; College of Physicians and Surgeons of San Francisco, 1907; aged 59; died, May 25, in the San Francisco Hospital, of cerebral hemorrhage and hypertension.

James Lee Wells, Brighton, Mass.; Harvard University Medical School, Boston, 1883; aged 78; died at Boston State Hospital, Boston, July 13, of general arteriosclerosis and bronchopneumonia.

D. Milton Goodner, Fayetteville, Tenn.; Medical College of Alabama, Mobile, 1876; member of the Tennessee State Medical Association; formerly mayor of Fayetteville; aged 83; died, August 28.

Aaron Benedict Sollenberger ✠ Waynesboro, Pa.; Baltimore Medical College, 1898; on the staff of the Waynesboro Hospital; aged 61; died, August 2, in the Johns Hopkins Hospital, Baltimore.

Edward T. Griffith, Santa Monica, Calif.; National Normal University College of Medicine, Lebanon, Ohio, 1892; Medical College of Indiana, Indianapolis, 1902; aged 67; died, June 2, of heart disease.

Egbert Tugwell, Baton Rouge, La.; University of Nashville (Tenn.) Medical Department, 1908; aged 45; died, August 13, at Our Lady of the Lake Sanitarium, of lobar pneumonia.

Alexander Monroe Allen, Buford, Tenn.; University of Nashville Medical Department, 1874; member of the Tennessee State Medical Association; aged 81; died, April 29, of arteriosclerosis.

S. Elizabeth Curry, Hastings upon Hudson, N. Y.; New York Medical College and Hospital for Women, Homeopathic, 1894; aged 74; died, May 30, in Yonkers, of carcinoma of the sigmoid.

William Otterbein Smith, Norristown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1878; aged 83; died, August 3, in the Riverview Hospital, of carcinoma of the rectum.

William J. McCuaig, Chicago; McGill University Faculty of Medicine, Montreal, Que., Canada, 1886; aged 72; died, August 28, in Los Angeles, of chronic valvular heart disease.

Marvin Fosdick, Almena, Mich.; University of Michigan Medical School, Ann Arbor, 1875; aged 85; died, June 18, of carcinoma of the left ear and gangrene of the right leg.

Philip A. Scott, Newport News, Va.; Howard University School of Medicine, Washington, D. C., 1901; aged 58; died, August 29, of pulmonary infarct and multiple abscesses.

John Milton Adams, Niles, Calif.; Rush Medical College, Chicago, 1882; aged 72; died, June 5, in the Southern Pacific Hospital, San Francisco, of carcinoma of the prostate.

J. Chase Stubbs ✠ Chicago; Chicago Medical College, 1889; on the staff of the Hospital of St. Anthony de Padua; aged 67; died, August 18, of chronic nephritis.

William T. Jones ✠ Horseheads, N. Y.; University of Buffalo School of Medicine, 1891; health officer of the town of Horseheads; aged 65; died, September 1.

Frederick W. D'Evelyn, San Francisco; University of Edinburgh Faculty of Medicine, Edinburgh, Scotland, 1886; aged 77; died, August 29, of arteriosclerosis.

George Welby Van Pelt, Crozet, Va.; University of Louisville (Ky.) School of Medicine, 1870; Civil War veteran; aged 89; died, June 17, of arteriosclerosis.

Frank R. Frazier, Yorkville, Ill.; Rush Medical College, Chicago, 1895; aged 60; died suddenly, August 7, in the Copley Hospital, Aurora, of cerebral hemorrhage.

John L. Sweeney ✠ Chicago; Baltimore University School of Medicine, 1898; aged 65; died, August 26, in the Evangelical Deaconess Hospital, of diabetes mellitus.

Ralph Eugene Worrell, Elmwood, Ill.; Northwestern University School of Medicine, Chicago, 1909; aged 52; was killed, August 28, in an automobile accident.

Clarence Theodore Lindley, Davenport, Iowa; Rush Medical College, Chicago, 1885; aged 75; died, September 25, in St. Luke's Hospital, of heart disease.

Jacob Pinkerton Easter, Clatskanie, Ore.; Physio-Medical Institute, Cincinnati, 1869; Civil War veteran; aged 88; died, July 13, of chronic endocarditis.

Samuel B. Snyder, Comstock, Mich.; University of Michigan Medical School, Ann Arbor, 1885; aged 74; died, August 13, of cerebral hemorrhage.

James Duncan McKenzie, Bissett, Manit., Canada; University of Manitoba Faculty of Medicine, Winnipeg, 1931; aged 26; was drowned, June 12.

Edgar Hazelwood Jones ✠ Eldora, Iowa; University Medical College of Kansas City, Mo., 1893; aged 73; died, August 7, of heart disease.

David Brekes, New York; New York Medical College, 1864; Civil War veteran; aged 92; died, August 2, of chronic myocarditis and senility.

Charles A. Hartzell, Fayetteville, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1887; aged 67; died, June 11, of myocarditis.

Carolyn E. Geisel, Tekonsha, Mich.; Eclectic Medical Institute, Cincinnati, 1887; aged 69; was found dead, September 15, of heart disease.

Harold Field Teed ✠ Sidney, N. Y.; Albany Medical College, 1924; aged 33; was found dead, August 27, of an overdose of chloroform.

Herbert Arthur Makinson, Oakland, Calif.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1903; aged 58; died, July 9.

William Augustus Meierdierks, San Francisco; Cooper Medical College, San Francisco, 1895; aged 62; died, July 5, in Santa Cruz, Calif.

Calvin A. Wisner ✠ Columbiaville, Mich.; Michigan College of Medicine, Detroit, 1881; aged 77; died, August 27, of cerebral hemorrhage.

John O. Cummins, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1901; aged 61; died, July 28, of heart disease.

Joseph Vincent Hinchman, Blair, Neb.; Medical College of Indiana, Indianapolis, 1885; aged 86; died, June 17, of bronchopneumonia.

James M. Mitchell ✠ Pontiac, Ill.; Rush Medical College, Chicago, 1900; aged 62; died, August 25, of carcinoma of the throat and mouth.

Clara Louise Normington, Janesville, Wis.; Woman's Hospital Medical College, Chicago, 1878; aged 78; died, August 15.

John Luther Millard ✠ Pinconning, Mich.; Detroit College of Medicine, 1902; aged 67; died, September 6, of angina pectoris.

R. J. Boatman, Carlsbad, N. M.; Missouri Medical College, St. Louis, 1892; aged 80; died, April 13, of interstitial nephritis.

Augustus F. Buchler, New York; College of Physicians and Surgeons in the City of New York, 1876; aged 77; died, July 27.

Denver Colorado Garner, Long Beach, Calif.; St. Louis College of Physicians and Surgeons, 1896; aged 61; died, July 11.

Adolf Pannkoke, Milwaukee; University of Göttingen, Germany, 1879; aged 79; died, August 31, of carcinoma of the bladder.

William Donald Kempton, Cincinnati; Miami Medical College, Cincinnati, 1873; aged 82; died, August 17, of heart disease.

James Hynes ✠ Minneapolis; Medical Department of Hamline University, Minneapolis, 1899; aged 65; was found dead, July 7.

Hattie G. Seward Lacy, Los Angeles; Woman's Hospital Medical College, Chicago, 1885; aged 74; died, June 18.

Thomas Barr, Whittier, Calif.; nongraduate; aged 88; died, April 23, of senility.

Correspondence

HYOSCYAMUS AND HYOSCINE

To the Editor:—In THE JOURNAL, August 20, in an article by Dr. Dinsmore on "Hyperthyroidism in Children," page 638, I note the following:

> We have now operated on forty-three patients with hyperthyroidism, with two deaths, one of which occurred before the advent of compound solution of iodine.

According to his memoirs, Lugol made extensive use of compound solution of iodine in 1827, some 105 years ago: this in the treatment of goiter.

Again, on page 659, under the title "The Medical History of Sir Walter Scott," it is stated:

> In one attack lasting six hours he took 6 grains of opium, 3 of scopolamine and nearly 200 drops of laudanum.

Disregarding the question of the identity of scopolamine and hyoscine and the fact that 1/100 grain of scopolamine or its salts might be considered a fair dose, scopolamine seems to have been discovered in crystalline form by Bender in 1889 and named by him. Our histories state that Sir Walter died in 1832, some fifty-seven years previously.

Since these statements do not present the appearance of typographic errors, they arouse my curiosity as matters of historical interest if nothing more.

WILLIAM N. MACARTNEY, M.D., Fort Covington, N. Y.

NOTE.—In the reference to Sir Walter Scott the stenographer copied the reference, changing hyoscyamus to hyoscine, and the error was not detected.

TOXICITY OF NUPERCAINE

To the Editor:—In a communication to THE JOURNAL, September 3, Dr. V. W. Jensen reported a reaction after the subcutaneous and submucous injection of nupercaine prior to a hemorrhoidectomy. The reaction consisted of dizziness, nausea, vomiting, loss of bladder and rectal control and unconsciousness. The reaction was not fatal.

Dr. Jensen states that he used from 5 to 6 cc. of a 1 per cent nupercaine solution. Although this may seem like a very small dose, it is in reality a very large dose. The regular concentration of nupercaine that is used for subcutaneous injection is a 1:1,000 solution. The amount of nupercaine used in the case reported was between 50 and 60 mg., which would be as much as from 50 to 60 cc. of a 1:1,000 solution.

I think this reaction can be attributed to an overdosage of the drug. When used in the 1:1,000 strength recommended, I have never seen a toxic reaction when limiting its use to not above 60 or 75 cc. ERNEST E. ARNHEIM, M.D., New York.

"PHRENECTOMY"

To the Editor:—The word "phrenectomy" is so much used at present to mean phrenic nerve resection that it may be justifiable to single it out from other misused words for comment.

The word "phren" is now applied to two regions, the diaphragm and the mind. The diaphragm is not often the site of such disease that any portion of it needs to be removed, but the word "phrenectomy" should be reserved for such a contingency. Since this word should have a definite meaning different from that in which it is being used, such use is not justifiable. In fact, such use is a metonomy too far fetched to be good English and is certainly bad science.

The science of medicine requires as exact a terminology as any science. Would it not then be pertinent to suggest that the committee studying medical nomenclature should select new terms as well as the designations of new diseases?

D. R. KNAPP, M.D., Kerrville, Texas.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

REACTION AFTER BLOOD TRANSFUSION

To the Editor:—A white girl, aged 20 years, weighing 90 pounds (41 Kg.) and rather poorly nourished, was icteric and ordinarily weak and listless. She has had several attacks of pellagra in the past five years. On admittance to the hospital, her erythrocyte count was 1,500,000 and the hemoglobin content 20 per cent. The urine was normal except for a trace of reducing sugar. The white blood cells numbered 6,000 per cubic millimeter, with 58 per cent polymorphonuclears and no eosinophils. No history of protein reactions in the past was obtained. The family history was negative. On admittance, the working diagnosis was secondary anemia following pellagra, and a blood transfusion was decided on in the hope of bettering hematopoiesis. The donor selected by the cross matching of both cells and serum of the donor and recipient (microscopically) was a white man, aged 28, in good health and with no unfavorable history. It is interesting to note in this connection that, of seven donors typed for this transfusion, all were compatible with the recipient in both the cell to serum and the serum to cell matching. The transfusion was started, Lewisohn's citrate method being used and the same technic that has been used here countless times without reactions. The blood was kept at body heat and instillation into the arm vein of the recipient started within two minutes after it had been drawn from the arm vein of the donor. After about 20 cc. had run in, the patient suddenly lost consciousness; the pulse, which had been 110 previously, became much slower and weaker but remained regular. The pupils dilated and the patient became moderately cyanotic, the sphincters released with a consequent emptying of the bladder, the breathing became shallow, and there was some slight spasmodic contraction of the skeletal musculature. Oxygen was administered and 10 minims (0.6 cc.) of solution of epinephrine hydrochloride injected into the arm. The transfusion was stopped. After about eight minutes the patient regained consciousness and was put back to bed. She suffered some chill for the next four hours and the temperature, which had been normal, was raised to 101 F., returning to about normal on the following day. Since that time she has remained in bed with a nearly normal temperature. A liver extract preparation has been started. Under the conditions, to what do you attribute the reaction and what do you advise in the way of further treatment? Is another attempt at transfusion advisable in your opinion? If not, what are the best indications for hematopoietic treatment? Please omit name. M.D., North Carolina.

ANSWER.—The reaction described is typically anaphylactic in nature and may be due to any one of a number of factors. Although rare in occurrence, such a reaction may take place in spite of absolute compatibility in the serum to cell and the cell to serum tests. In some clinics, in addition to the serologic test, the biologic test is made; that is, from 10 to 20 cc. of compatible blood is injected into the recipient and a period of from ten to fifteen minutes allowed to elapse in order to ascertain whether just such a reaction as described will occur.

One of the common factors overlooked is that reactions not apparent under the microscope may occur within the body when larger amounts of blood are injected. These are due to the presence of agglutinins and subgroups in the blood making the selection of a donor of the same type as the recipient preferable.

The presence of products of protein digestion in the blood stream of the donor may account for just such a reaction. If the donor has partaken of meat, eggs or milk within a short time previous to the transfusion, a sensitization of the blood may result.

On the whole, reactions occur more frequently with citrate transfusions than when whole blood is used. The reactions in general may be due to (1) poor typing, with consequent incompatibility; (2) chilling of the blood, particularly in the citrate method; (3) destruction of platelets by the citrate; (4) action of the blood on the rubber tubing; (5) ingestion of foods that increase the protein sensitization of blood; (6) injections of serums or antitoxins.

In this case another factor may be present. The patient was markedly icteric. Although jaundice per se does not as a rule cause reactions, the jaundice in this case may be hemolytic, and hemolysis may have occurred following injection of the donor's blood, in spite of the fact that it was not evident under the microscope.

For the treatment of the anemia in this case the principles generally accepted at present should be followed: a liberal diet with an abundance of meat, liver and green vegetables; liver extract by mouth or hypodermically; iron in any form, and cod liver oil.

As far as another transfusion is concerned, it may be tried if it is definitely ascertained that the jaundice is nonhemolytic. Before the transfusion, the donors should be typed, a cross-agglutination test performed both macroscopically and microscopically, and another biologic test performed.

BATHING DURING MENSTRUAL PERIOD

To the Editor:—What are the reasons, if any, why a woman should not take a tub bath or go in bathing at the time of the menstrual period? The women who compete in swimming matches must, of necessity, go in the water at the time of the period, and I have never heard or read of any ill effects.

ANDREW J. GILMOUR, M.D., New York.

ANSWER.—There is no good reason why most women may not take a tub bath or go in bathing during the menstrual period. However, if the flow of blood is profuse, a long or strenuous swim may make it excessive. Likewise, hot tub baths during the menses may increase the amount of blood lost. A cold bath taken just before or at the beginning of menstruation may occasionally stop the bleeding. The danger of infection from the water which may gain access to the vagina is practically nil. Certainly women who are accustomed to a daily tub bath, shower or swim may safely continue these ablutions throughout the menstrual period.

USE OF COLLOIDAL SULPHUR IN ARSENICAL DERMATITIS

To the Editor:—Would the administration of colloidal sulphur intravenously be of benefit in the treatment of arsenical dermatitis? I have recently had a number of cases of poisoning from the use of paris green and calcium arsenite in laborers who spray potato plants for bugs. The nasal mucous membranes become inflamed from the inhalation of the calcium arsenite dust. Many get a dermatitis of the hands and face. What would be good treatment? Please omit name. M.D., Minnesota.

ANSWER.—The arsenical dermatitis arising from the trade practices described may in part be attributed to the local action of arsenic compounds, and in part to systemic involvement.

The intravenous administration of colloidal sulphur is not recommended.

In dermatoses subsequent to arsenicals administered in the treatment of syphilis, colloidal sulphur has been used and has its advocates. However, at this time, dermatologists look with greater favor on the use of thiosulphates. Animal experiments tend to prove that these substances do not hasten the elimination of arsenic, and their worth has been questioned. No less, wide use of these thiosulphates suggests their value. At present the theory is current that such medicaments act as a buffer in the protection of various tissues against the action of arsenic compounds.

When used intravenously, the dose recommended is 10 cc. of a 5 per cent solution daily. Few persons react unfavorably after the administration of thiosulphates.

In addition to the foregoing, it may prove desirable to administer alkalis and to establish diuresis.

Foci of infection that may play some part in the causation or severity of the arsenical dermatitis are ordinarily best left alone during acute stages of arsenic skin involvement. Such activities as the removal of tonsils or teeth are never advisable during the height of the skin abnormality.

The problems here involved are further discussed in the following publications:

Critchley, A. M.: Arsenical Dermatitis During Antisyphilitic Treatment, *Practitioner* **124:** 578 (May) 1930.

Beinhauer, L. G.: Sodium Thiosulphate and Its Therapeutic Field in Syphilis, *Am. J. Syph.* **12:** 55 (Jan.) 1928.

Kuhn, H. A., and Reese, H. H.: Sodium Thiosulphate in Treatment of Metallic Intoxication, THE JOURNAL, Dec. 5, 1925, p. 1804.

Bugg, C. R., and Folkoff, Caspar: Arsenic Dermatitis in a Child, Treated with Sodium Thiosulphate, *Bull. Johns Hopkins Hosp.* **35:** 76 (March) 1924.

INVERTED NIPPLES

To the Editor:—I am working in a baby health station, a busy place. A mother last week called my attention to the fact that the nipples of her baby's breasts are becoming inverted. She would like to know whether this process can be checked. Her little girl of 4 years has the same condition. In view of the difficulty of nursing a baby if the mother has inverted nipples, I wonder whether a study of the matter has been made. It seems to me a problem worthy of study. Please omit name.

M.D., New York.

ANSWER.—Inversion of the nipples in the young female infant is due to a congenital shortness of the terminal ducts. There is no known remedy for this condition.

A similar inversion of the nipples may appear in adult life and is then due to a low grade mastitis with subsequent increase of fibrous connective tissue, which by contraction produces the same clinical picture. This likewise is not amenable to treatment. However, it is a common observation in nursing mothers whose nipples are of the inverted type that in response to the nursing stimulus the nipples not infrequently become sufficiently exposed by the engorgement due to the erectile muscle fibers under the areola to permit the infant to obtain a satisfactory grasp on the nipple. In late pregnancy it is permissible to instruct the patient to use her own clean fingers to draw out and massage the nipples if they can be seized at all; or when lactation begins the nipple can be pulled out by the use of an electric or hand pump just prior to placing the infant to the breast.

ARTHRITIS OF MARIE-STRÜMPELL TYPE

To the Editor:—Tell me how a type of arthritis called a rare type, Marie-Strümpell type, differs from other forms. This case baffled a group of specialists for a long time, as every test was negative: teeth, tonsils, sinuses, no bad history, no appendicitis, never any pelvic or abdominal signs, roentgenograms of all joints negative, no ptosis, but flatulence at times, no constipation, in short, nothing to go by. Starches were found to be not digested. There was not much deformity. The patella was tight. A hypertrophic arthritic trouble was finally called by this proper noun, being caused by a chemical poison formed in the process of digestion and having affinity for the capsules of all the joints. The patient is in great pain; there is stiffness; she can't walk. The lower limbs are in extension, the arms becoming flexed at the elbows. Trophic changes have occurred in the skin. The hair is brittle and oily. There is redness of skin. At times the nails, hands and nose are almost blue. The patient is a woman, aged 54, and had it coming on very slowly for years. Please tell me the morbid anatomy and the pathology of this uncommon type and all you can. The pain seems to be of the nerve root kind, very acute. Baths, Zander treatment, electricity, baking and drugs have proved of no value. A low carbohydrate diet has been ordered. One hip and two knees have been opened; the cartilages are normal pale, the capsules affected. Plastic operations and oil immersions gave no result; the fascia and oil were soon absorbed. Textbooks give no space to this type of arthritis.

A. K. DARMOND, M.D., Methuen, Mass.

ANSWER.—Pierre Marie coined the term rhizomelic spondylitis. He described the condition as an extremely pronounced rigidity of the spine and ankylosis of the hip and shoulder joint.

In a description of an advanced case, Strümpell emphasized the progressive course of the disease, which, without pain, ends in complete ankylosis of the spine and hips, so that the head, trunk and femurs are firmly fixed to one another and are completely rigid, while all the other joints retain normal mobility and a peculiar alteration of the attitude and gait results. Knaggs uses the term spondylitis ossificans ligamentosa, in which ossification of ligaments is the conspicuous abnormality in a large proportion of museum specimens of spondylitis deformans.

Following is a contrast of the two types of spondylitis deformans as given by Frankel:

Bechterew Type	*Marie-Strümpell Type*
Stiffening of the spine from above downward, descending.	Stiffening of the spine from below upward.
The ankylosis results in a very bent attitude; kyphosis is always present.	The ankylosis results in an erect attitude; kyphosis is seldom seen.
Nerve root symptoms and irritation phenomena are always present.	Nerve manifestations may be missing in some cases.
Joints of the extremities never involved.	The root joints of the extremities always involved and other small joints often ankylosed.
Paretic condition of the muscles with slight atrophy.	Atrophy of the musculature is often very pronounced.
Process begins as an infection of the pia spinalis.	Primary process is an ossification of the spine.
Etiology: heredity, trauma, syphilis.	Etiology: rheumatism and infection.

It is evident that the essential difference is the commencement as an infection of the spinal meninges, but much more evidence is required before it is proved that the two types are distinct.

Buckley, therefore, adopts the classification of spondylitis in two main groups: spondylitis ankylopoietica or ankylosing spondylitis, which includes both the von Bechterew type and the Marie-Strümpell type; and, second, spondylitis osteo-arthritica, the degenerative or hypertrophic osteo-arthritic form.

Wilks designated the hypertrophic type as laborer's spine.

C. W. Buckley (*Brit. M. J.* **1**:1108 [June 27] 1931) states that an excellent account of spondylitis ankylopoietica was described by Connor in 1700. Fagge in 1877 described a similar case. Buckley states that the characteristic feature of spondylosrhizomélique of Marie and Strümpell is the great softening and fragility of the bones.

This is evidently a case of arthritis deformans. One must consider fibrositis, capsulitis and myositis. Roentgenograms of all joints were negative. It is possible, however, that sufficient time has elapsed to warrant reexamination to determine bone, joint and soft tissue changes. There are evidently neurologic, trophic and circulatory disturbances in this case. No mention is made of endocrine disturbances, especially ovarian.

The flexion of the elbows may be postural, which may result in deformities of the hands and wrist. More than 60 per cent of arthritic patients are said to have disturbances of carbohydrate metabolism.

The case described fits in the classification of rheumatoid, infectious or atrophic arthritis. Almost every reasonable method of treatment has been used here except vaccines, which should be tried. They should be of the autogenous and stock varieties combined, such as the Burbank and the Crowe.

The nerve root pain fits in with what is known as radiculitis, a subject that has been written about considerably by Gunther and Kerr.

PAIN IN FOOT DUE TO HALLUX RIGIDUS

To the Editor:—About nine months ago a girl, aged 19 years, while playing a game, stubbed her great toe. It became painful, and she found that she could not extend it. Roentgen examination did not reveal anything except two small sesamoid bones in the flexor tendons. At present her toe is not swollen and does not show anything on examination except pain when it is flexed, and it is not possible for her to extend it. Any excess use of the foot causes pain in the joint, which is so severe that she is not able to use the foot for a few days. After a few days' rest, she can use the foot again. I should like to know whether these sesamoid bones could possibly be the cause of the pain.

L. M. SUTTER, M.D., Orlando, Fla.

ANSWER.—The sesamoid bones are probably not the cause of the trouble. This case is more likely one of hallux rigidus. Normal sesamoids are usually injured by a jump or step from a height. It would be desirable to have further roentgen studies from various angles. A long bar of metal in the shoe along the inner border of the sole will help to prevent motion at the metatarsophalangeal joint. The treatment includes modifications of the shoes; gentle massage of the foot twice daily; contrast sprays, alternating warm one minute and cool one minute, for ten minutes twice daily; and simple nonweight bearing exercises for the metatarsal arch.

EPILEPTIFORM SEIZURE APPEARING AFTER OPERATION

To the Editor:—A woman, aged 53, had her gallbladder removed twelve years ago. Soon after returning home from the hospital she began to have seizures consisting of violent jerking of the arms and legs. This occurs only when she is asleep, but the seizures awaken her and continue until she gets up, only to recur when she returns to bed. She is free of symptoms during the day. She also complains of numbness in her arms and legs during the attacks. The past history is negative. She has a good appetite and has not lost weight but gets little sleep except when under the influence of amytal or a similar soporific. The reflexes are all exaggerated but otherwise neurologic examination is negative. The blood count, Wassermann reaction, urine and blood pressure are normal. The menopause occurred three years ago, and the patient was no worse during the period of change. Could you give me suggestions as to the possible cause of such a condition occurring only when the patient is completely relaxed? The seizures are not convulsions nor does she lose consciousness. Please omit name.

M.D., Nebraska.

ANSWER.—From the facts given, the most probable conclusion to be drawn is that the seizures are of epileptiform character. Seizures of this kind are sometimes solely nocturnal, and patients will often have seizures only during a period of relaxation. The fact that the onset is during sleep would preclude the observation of an initial period of unconsciousness. While not usual, it is not rare for a patient to be conscious during part of the seizure. Since the attacks occur only during sleep, it is even possible that she may have had them before the cholecystectomy. Again, it is possible that the disease, whatever it was, that gave rise to the necessity for the operation may have caused some damage of the brain which has resulted in the appearance of the seizures. The administration of phenobarbital at bedtime is suggested as a therapeutic measure.

DRY MOUTH AFTER ALCOHOL

To the Editor:—Please explain the dry mouth after taking alcoholic beverages. This seems to occur even when enough water is consumed along with the alcohol to more than compensate for the excess which might be lost through diuresis or through dilatation of skin vessels. Please omit name.

M.D., New York.

ANSWER.—The sensation from the mouth or pharynx after alcoholic beverages is not one of pure dryness, or at least that is not the experience of some competent observers. Beverages with small amounts of alcohol, such as beer, do not produce an immediate sensation of dryness in the mouth. Beverages with high alcoholic content, such as whisky, when taken straight, produce temporary irritation of the mouth and throat mucosa, and some people take water to counteract or remove this irritation. Beverages with a high content of alcohol are, of course, hypertonic, but under ordinary conditions they are not retained long enough in the mouth to cause actual dryness of the mucous membrane of the mouth and throat. It is, however, a more universal experience that thirst increases a few hours after ingestion of beverages containing a considerable amount of alcohol. The mechanism leading to this increased thirst is probably complex and involves not only the increased elimination of water by the kidneys (diuretic effect of alcohol) but also increased loss of water through the skin and sweat glands and possibly also through the lungs from increased respiration. That varying amounts of alcohol in the blood impairs the secretion of saliva and the production of the mucin by the mucous glands in the mouth and throat is not yet known, but this is a possible factor in postprandial dryness and thirst.

EPILEPSY IN PREGNANCY

To the Editor:—A newly married woman, aged 27, has suffered from major epileptic attacks since the age of 15. The seizures occur about once a month. She is now pregnant. What is likely to be the effect of the pregnancy on the present and future course of her epilepsy? What are the chances of the disease being inherited by the baby? Is epilepsy in the mother an indication for therapeutic abortion? The health of both the woman and her husband is excellent except for the epileptic attacks. Please omit name.

M.D., New York.

ANSWER.—The frequency of recurrence of epileptic seizures may not be affected by pregnancy; sometimes it becomes greater and sometimes less, even to total cessation. Similarly with regard to the future course of the epileptic condition, the greatest probability is that it will continue as before the pregnancy. One of the most important factors in the etiology of essential epilepsy is heredity, but epileptic mothers have borne many children who have not developed epilepsy. The primary consideration in deciding on therapeutic abortion is the health of the mother; unless there should develop such a frequency of seizures that the health or life of the mother is endangered, an extremely remote possibility, epilepsy in the mother is not generally considered an indication for therapeutic abortion.

TREATMENT OF UNDESCENDED TESTIS

To the Editor:—Should an undescended testicle in a child of 4 years be brought down at once or be allowed to remain in the inguinal canal until puberty—of course, I refer to surgical treatment? Please omit name.

M.D., New York.

ANSWER.—The age of choice is usually between 6 and 8 years and the patient should certainly be operated on by the time he is 10 years old. It is preferable to wait until about the age of 5 or 6 years, as the tissues are a little easier to handle. There is every reason to think that it makes little difference when the operation is done as long as the testis is placed in the scrotum before it begins to develop at puberty. This is usually about the age of 13. Occasionally it is earlier and one should not take any chances on delaying the operation until then, as failure of descent will interfere with the normal development and may permanently impair spermatogenesis.

Certainly in no case should one wait until puberty to bring down the testis. However, if it has not been operated on for some reason, it should be brought down into the scrotum as soon as possible, even after puberty.

RESECTION OF PUDENDAL NERVES FOR PRURITUS VULVAE

To the Editor:—Please give an outline of the technic of Tavel in resecting the pudendal nerves in pruritus vulvae. Please omit name.

M.D., Pennsylvania.

ANSWER.—The only reference available to the name of Tavel in medical literature is in Culbertson's "Monograph of Pelvic Surgery." Culbertson does not refer to the article of Tavel in his bibliography. He has the following to say concerning resection of the perineal nerves: "Tavel resected cutaneous branches of the pudic nerve through an incision carried down midway between the tuberosity of the ischium and anus. This incision made sagittally, 8 to 10 cm. long, its center corresponding to the bi-ischiatic line. Injury to the inferior hemorrhoidal nerve is avoided by isolating it at the line of the ischial spine. The dissection is carried out down through the fascial sheath, exposing the internal pudic nerve and blood vessels. The various branches of the nerve are tested out and only those corresponding to the hyperaesthetic area are resected."

A number of authors refer to the method of Mauclaire, who also resected the pudic nerves for the cure of pruritus vulvae. Taussig describes this technic as follows: "Resection is carried out in each side where the internal pudic nerve emerges

from the pelvis. A second incision along the ascending branch of the ischium exposed the superior perineal branch, which is also resected on both sides. This procedure resulted in cessation of pruritus but not of anesthesia of the vulva."

Crossen warns that care must be taken in performing this operation so that the innervation of the rectum be not damaged with resulting incontinence of feces.

HAZARDS TO ANESTHETIST

To the Editor:—1. Are there any authentic records about the ill effects, if any, of the repeated inhalation of ether by anesthetists while administering ether by the drop method? I have noticed a slight irritation of the respiratory passages and a "groggy" feeling after having given several anesthetics in one day. 2. Is there evidence that a professional anesthetist will not have as long a life expectancy as an ordinary person? I ask this because two physicians in this small town who gave the majority of anesthetics both died suddenly in the early fifties—one from an attack of angina, while the other had what was thought to be a cerebral thrombosis. He had a hypotension. Will ether produce any deterioration of the cardiovascular system when inhaled year in and year out? 3. I am supposed to have had a minimal amount of pulmonary tuberculosis years ago. Now I feel that it is arrested. Is there any great hazard in my giving anesthetics? Please omit name.

M.D., Tennessee.

ANSWER.—1. There are no authentic records available concerning serious untoward effects to the anesthetist following inhalations of ether during its administration by the drop method.

2. There is no concrete evidence that, so far as the inhalation of ether vapor is concerned, a professional anesthetist will have a shorter life than a person not engaged in this work. A few years ago, following the death of a prominent Canadian anesthetist, the question arose as to whether his death was due to effects produced by the repeated inhalation of ether during its administration.

3. The continued frequent administration of anesthetics probably will not increase the probability that the anesthetist will have a recurrence of pulmonary tuberculosis.

POISONING FROM LEMONADE IN ENAMEL-WARE UTENSILS

To the Editor:—In THE JOURNAL, July 23, page 327, was an inquiry about the possibility of lead poisoning from lemonade which had stood in a gray enameled pot for several hours. My brother, who is a ceramic engineer and who is well acquainted with the technical details of the manufacture of such articles, informs me that it was no doubt antimony poisoning. The gray enamel ware commonly called granite ware contains from 3 to 7 per cent of Sb_2O_3 (antimony trioxide). The gray ware enamel is applied at the rate of 0.15 Gm. per square inch on each surface. The inside of a measuring cup is about 25 square inches. As $25 \times 0.15 \times 0.07 = 0.2625$, about 0.26 Gm. of antimony might be in solution per cupful if it was 7 per cent antimony enamel and all the antimony was dissolved out. If the vessel was of such size and shape that 100 square inches was exposed to the solution, 1 Gm. of antimony might be dissolved. None of the cooking ware enamels contain any lead, and the highest grades contain neither lead nor antimony. Lead is present in cast iron enamels, such as is used on bath tubs and sinks. An acid proof enamel has recently been developed. Heat sterilization of antimony and potassium tartrate (tartar emetic) has been found to make it much more toxic for intravenous use than if it was sterilized by other methods. Reasoning from this, it would seem that the making of hot lemonade in a gray enameled vessel might produce a beverage quite dangerous to consume.

BEN E. WAGNER, M.D., Berwyn, Ill.

SODIUM IODIDE INTRAVENOUSLY

To the Editor:—In THE JOURNAL, July 23, you reply in a competent manner to a question with regard to desensitization to bacterial proteins. However, after discussing the use of bacterial vaccines you state that other methods may be tried and include in those recommended the use of sodium iodide intravenously. This recommendation does not seem to be justifiable, since it is well known that all the effects of iodide can be obtained rapidly by oral administration, and since many observers have repeatedly pointed out the dangers of intravenous administrations, particularly in allergic individuals. Roentgen therapy to the chest or spleen or both, while it has been recommended by some authors, is also not without considerable danger since such therapy, particularly in young people, appears to interfere with protective mechanisms and several fatal infections have followed such treatments.

MILTON B. COHEN, M.D., Cleveland.

CHIGGERS

To the Editor:—The annoying pest chiggers was the subject of an inquiry in THE JOURNAL, July 30, page 412. The late Dr. S. C. Benedict of Athens, Ga., suggested about fifteen years ago the use of flexible collodion because of its asphyxiating effect with ether, after the affected area has been painted with tincture of iodine, which is allowed at first to dry. If used early, the relief is prompt in a few hours.

R. M. HARBIN, M.D., Rome, Ga.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Milwaukee, June 12. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written.* Nineteen cities in the United States and Canada, Oct. 22. *General, oral and clinical.* Los Angeles, Dec. 7. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

ARKANSAS: *Basic Science.* Little Rock, Nov. 7. Sec., Mr. Louis E. Gebauer, 1002 Donaghey Bldg., Little Rock. *Regular.* Little Rock, Nov. 8-9. Sec., Dr. Sam J. Allbright, Searcy. *Eclectic.* Little Rock, Nov. 8. Sec., Dr. Claude E. Laws, 803½ Garrison Ave., Fort Smith. *Homeopathic.* Little Rock, Nov. 8. Sec., Dr. Allison A. Pringle, Eureka Springs.

CONNECTICUT: *Regular.* Hartford, Nov. 8-9. *Endorsement.* Hartford, Nov. 22. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* New Haven, Nov. 8. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

FLORIDA: Jacksonville, Nov. 14-15. Sec., Dr. William M. Rowlett, 706 Franklin St., Tampa.

MAINE: Portland, Nov. 8-9. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland.

MASSACHUSETTS: Boston, Nov. 8-10. Sec., Dr. Stephen Rushmore, 144 State House, Boston.

NEBRASKA: Lincoln, Nov. 29-30. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, Nov. 7-9. Sec., Dr. Edward E. Hamer, Carson City.

SOUTH CAROLINA: Columbia, Nov. 8. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

WEST VIRGINIA: Morgantown, Nov. 16-18. Sec., Dr. W. T. Henshaw, Charleston.

Georgia June Report

Mr. R. C. Coleman, joint secretary, Georgia State Board of Medical Examiners, reports the written examination held in Atlanta, June 15-16, 1932. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Eighty-nine candidates were examined, all of whom passed. Seven physicians were licensed by reciprocity with other states. The following colleges were represented:

PASSED			
College	Year Grad.	Per Cent	
Howard University College of Medicine	(1930)	86.3,	(1931) 87.9, (1932) 82.9, 87.3, 87.3, 88.9, 89.1, 91.6, 91.8
Emory University School of Medicine	(1932)	84.3,	85.4, 86.7, 87.3, 87.7, 88.7, 89.2, 89.2, 89.9, 89.9, 90, 90, 90, 90.1, 90.1, 90.1, 90.3, 90.6, 90.7, 90.9, 91, 91, 91, 91.1, 91.1, 91.1, 91.3, 91.4, 91.4, 91.6, 91.9, 92.6, 92.6, 92.8, 92.9, 92.9, 93.1, 93.8
University of Georgia Medical Department	(1932)	86.9,	87.4, 87.6, 88.3, 88.9, 88.9, 89, 89.1, 89.1, 89.4, 89.7, 90, 90, 90.2, 90.2, 90.3, 90.4, 90.4, 90.4, 90.4, 90.6, 90.6, 90.8, 90.8, 90.9, 91, 91.1, 91.2, 91.3, 91.4, 91.4, 92.2, 92.3, 92.6, 93.9, 95.4
Meharry Medical College	(1932)	84.6, 89.6, 89.8, 91.2	
University of Tennessee College of Medicine	(1930)	88.9,	(1932) 86.3

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
Emory University School of Medicine	(1931)	Virginia
University of Illinois College of Medicine	(1928)	Michigan
University of Louisville Medical Department	(1910)	Tennessee
Tulane University of Louisiana School of Medicine	(1927)	Alabama
Meharry Medical College	(1931)	Tennessee
Baylor University College of Medicine	(1930)	Texas
University of Toronto Faculty of Medicine	(1927)	New York

West Virginia July Report

Dr. W. T. Henshaw, secretary, Public Health Council of West Virginia, reports the written and oral examination held in Harpers Ferry, July 12-14, 1932. The examination covered 11 subjects and included 110 questions. An average of 80 per cent was required to pass. Twelve candidates were examined, 11 of whom passed and one failed. Eight physicians were licensed by reciprocity with other states. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent
Howard University College of Medicine	(1931)	85
Northwestern University Medical School	(1932)	90
Rush Medical College	(1932)	84, 86
University of Maryland School of Medicine and College of Physicians and Surgeons	(1931)	86, 86
University and Bellevue Hospital Medical College	(1931)	82, 85
Ohio State University College of Medicine	(1931)	87
Western Reserve University School of Medicine	(1931)	84
Medical College of Virginia	(1931)	80

FAILED		
College	Year Grad.	Per Cent
University of Leipzig Faculty of Medicine	(1926)*	76

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Maryland School of Medicine and College of Physicians and Surgeons		(1926)	Maryland
Ohio State University College of Medicine		(1931)	Ohio
University of Cincinnati College of Medicine		(1932)	Ohio
Temple University School of Medicine		(1931)	Ohio
Vanderbilt University School of Medicine		(1900)	Utah
University of Tennessee College of Medicine		(1929)	Tennessee
Medical College of Virginia		(1928), (1929)	Virginia

* Verification of graduation in process.

South Dakota July Report

Dr. H. R. Kenaston, director, Division of Medical Licensure, South Dakota Board of Health, reports the oral, written and practical examination held in Waubay, July 19-20, 1932. The examination covered 15 subjects and included 105 questions. An average of 75 per cent was required to pass. Ten candidates were examined, all of whom passed. Five physicians were licensed by reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1931)	86.9
Loyola University School of Medicine		(1932)	90.5
Northwestern University Medical School		(1930)	90.1
Rush Medical College		(1932)	85.2
University of Illinois College of Medicine		(1932)	88.7
University of Minnesota Medical School		(1926) (1929) 87.6, (1931) 89.2	87.3,
University Medical College of Kansas City, Mo.		(1906)	84.3
Creighton University School of Medicine		(1928)	81.7

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1927)	Colorado
Keokuk Medical College, College of Phys. and Surgs.		(1906)	Iowa
University of Maryland School of Medicine and College of Physicians and Surgeons		(1929)	W. Virginia
Detroit College of Medicine and Surgery		(1928)	Michigan
University of Nebraska College of Medicine		(1931)	Kansas

Book Notices

Puerperal Infection. By James Robert Goodall, O.B.E., B.A., M.D., Clinical Professor of Gynecology and Obstetrics, McGill University. Cloth. Pp. 189, with illustrations. Montreal: The Author, 1932.

In this small volume, written first for his students and revised for general practitioners, Professor Goodall embodies the results of twenty-eight years of clinical experience and inquiry. In general his views on the causative agents and the pathology of puerperal infection correspond to those of modern obstetricians. In two things he differs somewhat from the usual teaching. He discards the term "sapremia" and makes no attempt to distinguish between wound intoxication and wound infection. While saprophytes or avirulent bacteria may sometimes assume a parasitic rôle or become virulent, it is true, nevertheless, that the picture of an ordinary sapremia due to the decomposition of retained blood clots, placental débris, and especially remanants of incomplete abortions, is quite different from that of an infection. The disease condition requires a different treatment, so that it is desirable to call particular attention to it. Sapremia is generally associated with stoppage of the lochia, and drainage is an essential element of treatment. This may sometimes require manipulations not consistent with the author's recommendation of "surgical inactivity when dealing with retained products of conception."

Professor Goodall contends that the minimum standard of 100.4 F. determining morbidity, adopted by the American College of Surgeons and in general use, is too high and favors using a temperature of 99 or more for three consecutive days after the day of delivery, plus obvious morbid cases without fever. With this standard he finds in the Montreal hospitals the morbidity between 30 and 40 per cent, the higher rate occurring in multiparas. He believes that a slight fever discovered by the use of this standard is largely due to autogenous infection, which affects chiefly the cervix uteri. While it cannot be denied that continued temperature above 99 is abnormal in women during pregnancy or after completion of puerperal involution, it is not improbable that absorption of blood clots and of the protein mass from the involuting uterus may cause a slight rise in temperature. To secure comparable statistics it is desirable to adhere to the recognized minimum standard of 100.4 F.

The discussion of symptoms and diagnoses is clear and detailed. With the exception mentioned, treatment, general, surgical and special, is concisely given and in line with the best modern practice. A chapter on breast infection during lactation is added. An index would be a convenience to the reader. The book is a valuable presentation of the present state of our knowledge of puerperal infection by a teacher who has had a large experience and who has understood how to use such experience profitably.

Guide to Localized Bi-Terminal Tonsillar Coagulation. By L. Leo Doane, A.M., M.D., Ph.D., Attending Ear, Nose and Throat Surgeon to the Butler County Memorial Hospital, Butler, Pa. Cloth. Price, $3. Pp. 112, with 26 illustrations. Butler: Washburn & Company, 1931.

In this little book Dr. Doane details his methods of tonsillar coagulation. He first discusses the anatomy of the tonsils and adjacent parts, such as the pillars, the fossae and the blood and nerve supply. The author is of the opinion that, unless there are special indications, the plica semilunaris and plica triangularis should not be removed during electrocoagulation. He insists that a very careful history be taken in order to elicit details regarding previous infections of the tonsils, glands, nasal accessory sinuses, larynx, ear and nose. All laryngologists have observed caseous plugs in the tonsils, and many laryngologists are of the opinion that they are found in practically all tonsils and that unless they produce a fetor ex ore their presence is not a definite indication for tonsillectomy. Dr. Doane says: "While one cannot say positively that this material is infected and infecting, it is practically safe to assume that it is and, in probably 95 per cent of cases, removal of tonsils will demonstrate in results that the assumption has been correct."

The author apparently believes that the tonsils are a much greater source of systemic infections than is assumed by many laryngologists. When the theory of focal infection was first elaborated great enthusiasm was aroused, and even to this day many physicians continue to ascribe to the tonsils, teeth, sinuses and gallbladder practically all the infections or many of the infections that flesh is heir to.

The author feels that coagulation is a much less dangerous procedure than surgery and can usually be carried out even in children, at or above the age of 10. He feels, however, that the adenoid tissue should be removed with instruments, if possible under local anesthesia, and that in those cases in which the child is nervous and young but still requires coagulation it can be done under general anesthesia, provided the ether is removed from the room before the coagulating current is applied. Dr. Doane then describes in detail the instruments employed for electrocoagulation and their methods of application. While he formerly used injections of procaine hydrochloride into the pillars, he believes that this method is undesirable because the edema that it causes interferes with the landmarks, and, if the fluid is injected in the tonsil itself, more electric heat must be used in order to coagulate the tissues. He is in favor of a topical application of 10 per cent cocaine, 2 per cent nupercaine or 2 per cent butyn to the tonsils. He admits that an attempt to coagulate the entire tonsil at one sitting is inadvisable. This is contrary to the view held by some coagulation enthusiasts. Doane admits that in some cases in which previous operations have been done it is impossible to know definitely whether the crypts have been entirely destroyed or whether portions have merely been covered by scar tissue, thus retaining infectious material. We agree with him when he says: "Cases of another class will be met with more or less frequently by those doing much tonsil work, namely, cases where a tonsillectomy has been done at some time and where tags remaining or a considerable portion of the tonsils are present." Some case reports are listed at the end of the monograph.

All in all, this little work is a careful presentation of the subject of electrocoagulation of the tonsils, and considerable credit is due Dr. Doane for his fairness in presenting the various methods, and for his skill and ingenuity in devising the retractors. Unless it is carefully performed in a good many sittings it is difficult to remove completely all tonsil tissue. For the removal of tags and remnants, it is no doubt a most excellent method. When there are no contraindications, surgery seems to offer better promise of complete removal of the tonsils by one of the various methods usually employed and is probably the better procedure.

An Introduction to "Avertin" Rectal Anaesthesia. By J. Kempson Maddox, M.D., Ch.M., M.R.C.P., Honorary Assistant Physician, Supervisor of Students, Royal Prince Alfred Hospital, Sydney. With a foreword by Harold R. Dew, M.B., F.R.C.S., F.R.A.C.S., Professor of Surgery, University of Sydney. Cloth. Price, 9/-. Pp. 124, with 2 illustrations. Sydney, Australia: Angus & Robertson, Ltd., 1931.

The author has written this book to provide a guide to help Australian practitioners, especially those in the country districts, who must rely for direction on hearsay, an odd article in a journal, or the brief direction of the advertising booklet. Beyond a few practical suggestions the author claims no originality for the content of the volume, although he has well reviewed such literature as is available to him. The first chapter deals with the history of rectal anesthesia, especially with ether, up to the recent introduction of "avertin," together with an explanation of fundamental physiologic effects of anesthetics given by rectum as compared with the effects when given by inhalation. The second chapter explains the chemistry and pharmacology of the drug, emphasizing its effect on the cardiovascular, respiratory and central nervous system. The author discusses the absorption, detoxication and excretion of the drug. A few words are written on the effect of long continued administration and the effect of the drug on certain constituents of the blood plasma. The third chapter deals with clinical considerations of rectal narcosis, wherein the advantages and disadvantages of the drug in certain fields of surgery, its relative safety, and the selection of the patients, including indications and contraindications for its use, are discussed. Use of the drug for patients with cardiac disease, diseases of the kidney, diabetes, hyperthyroidism, and varying degrees of debility are emphasized. Frequent reference is made throughout to the use of a dose sufficient to produce full anesthesia, as compared with a dose producing basal anesthesia. The fourth chapter deals with the technic of administration such as the method of mixing and testing with congo red. The author emphasizes the fact that congo red cannot be used in any buffered solution but is useful only when water is the solvent. Frequent reference is made to the various combinations of "avertin" with other local and general anesthetics. Various preliminary medicaments and their dosage are presented. A paragraph is devoted to the complications and sequelae associated with "avertin" anesthesia. The use of "avertin" in the various specialties, with mention of the advantages of its use in children, obstetrics, and surgery of the nose, throat, and oral cavity, is discussed in the fifth chapter. Mention is made of the use of "avertin" in surgery of the head and neck, especially in surgery of the thyroid gland, and ophthalmology, and in gynecology its use as an antispasmodic is explained. The sixth chapter deals with deaths under "avertin" anesthesia and shows that the use of "avertin" is now past the experimental stage; indications for its use are clear-cut, and deaths, when they occur, are usually due to faulty combinations of the drug with preliminary medicaments, use of the drug when it is definitely contraindicated, or overdose. The book is, as entitled, an excellent "introduction to 'avertin' rectal anesthesia."

Clinical Interpretation of Laboratory Reports. By Albert S. Welch, A.B., M.D., Clinical Instructor in Medicine in the University of Kansas School of Medicine in Kansas City, Kansas. Cloth. Price, $4. Pp. 366, with 17 illustrations. Philadelphia: P. Blakiston's Son & Co., 1932.

There has been the complaint from practitioners that those interested in laboratory diagnosis are so engrossed in the mother sciences of chemistry, physiology and pathology that they fail to give adequate attention to the correlation with the clinical approach. There is doubtless much truth on both sides, so much, in fact, as to justify the publication of this book if only to give the critics something to shoot at. As is clearly stated in the preface, "the book is intended for clinicians whose primary interest is the care of their patients and whose knowledge must be ever broadening through things of attested value." Under existing conditions it is almost impossible for even a qualified practitioner of medicine to perform the technical duties of a laboratory worker; hence he must avail himself of a skilled technician or laboratory services. The purpose of this book is to evaluate for the clinician those laboratory procedures which will be of practical use to him and aid him in interpreting the clinical significance of the results. The text covers the usual list of subjects ordinarily considered under laboratory diagnosis, together with chapters on skin tests, tissue examination, electrocardiography, and forensic and special tests. The discussion is concise, and for detailed information the reader is referred to more comprehensive articles cited by the author in a bibliography at the end of the book. Objection might be taken to a few statements by the author, such as citing a value of 7.5 mg. of calcium as a low normal value and dismissing the subject of hypercalcemia with the statement that high values are usually due to technical errors. But, for the most part, the author has covered the material well. It is doubtful whether this book will be received without much criticism, particularly by those interested in laboratory diagnosis. The author has anticipated this in his preface, but there is some question whether he has justified his contentions in some parts of the book. The book, however, is offered with a sincere and rational purpose and can be profitably read by those who desire only an epitomized knowledge of the clinical interpretation of laboratory work.

Die Lungentuberkulose: Lehrbuch der diagnostischen Irrtümer. Von Dr. K. Nicol, ärztlicher Direktor der Heilstätte Donaustauf bei Regensburg, und Dr. G. Schröder, ärztlicher Leiter der neuen Heilanstalt Schömberg bei Wildbad. Second edition. Cloth. Price, 22 marks. Pp. 328, with 160 illustrations. Munich: Verlag der aerztlichen Rundschau Otto Gmelin, 1932.

The first edition of this work, published in 1927, aimed to collect and to clarify the diagnostic knowledge of pulmonary tuberculosis for general practitioners and sanatorium physicians. Recent teaching regarding the importance of collateral inflammation and infiltration in beginning pulmonary tuberculosis has influenced the authors, in this edition, to an extensive discussion of the pathogenesis of pulmonary tuberculosis. This has resulted in the addition of many more roentgenograms of the chest to illustrate the new teaching. As the authors say, the practitioner is too often poised between Scylla and Charybdis in the matter of the early diagnosis of pulmonary tuberculosis. Some 80 per cent of patients are found too late, and some 40 per cent of those admitted to sanatoriums arrive too late. On the other hand, about 30 per cent of patients admitted to sanatoriums have been incorrectly diagnosed as tuberculous. The latter mistake can also be serious, tending to create malingerers. The recognition of an apical lesion does not always mean an early diagnosis of pulmonary tuberculosis. The beginning of the adult type of pulmonary tuberculosis is by no means always apical, and apical lesions are often secondary lesions. The authors agree with the allergic concept of Ranke regarding three stages of tuberculosis. The fundamental importance of the constitution of the individual cannot be measured. There is no way of estimating an inherited disposition. The primary infection of childhood, which is usually in the midfield of the lungs, is discussed in its pathologic bearings, its absorption, or its further development by perifocal inflammation. A similar account is given of the infected lymph nodes. The bronchial lymph nodes do not heal as readily as do the primary lung foci. Perifocal inflammation can extend from either, leading to such conditions as interlobar pleurisy. Excellent roentgenograms are given illustrating the possible results of the primary childhood infection. The hematogenous spread of tubercle in the lungs is illustrated, with especial reference to the apical lesions described by Simon. Special charts are given to illustrate the development of pulmonary tuberculosis in childhood and puberty and to depict the changes that occur in the adult type. The new teaching in regard to the development of adult pulmonary tuberculosis is compared with the old. In the latter the focus of reinfection has been considered as a small growing deposit, usually in the apex of the lung. This deposit undergoes caseation. Its recognition at first can be made only by roentgen examination. Redeker, from the study of a series of some 20,000 roentgenograms of the chest, is the leader of the new teaching. The new lesion is now believed to begin in an acute manner, and on account of the perifocal inflammation this lesion is represented by a large infiltration. The recognition of this new lesion constitutes an early diagnosis. Its location is rarely in the apex of the lung; in fact, Redeker considers most apical lesions as late lesions and their diagnosis as a late diagnosis. All phases of history taking and physical examination are carefully described, but the practitioner is warned that without proper roentgen investigation no early diagnosis can be made. In the

matter of the differential diagnosis, every conceivable lung disease is discussed, possibly the only omission being aspergillosis. Cases of syphilis of the lung, with roentgenograms, are thoroughly described. A chapter is given illustrating the difficulty of determining whether in a patient with pulmonary tuberculosis the disease is active or not. All the well known blood examinations are detailed. The sedimentation test is considered of importance in determining the activity of childhood infection. The large numbers of roentgenograms representing every phase in the development of tubercle and every phase of the results of tuberculosis of the lungs are of surpassing excellence. The publisher, although unfortunately omitting an index, should be included in the praise that is the merit of the authors. The binding and typing of this splendid work make an artistic production.

Medical Supervision and Service in Industry. Cloth. Price, $2. Pp. 125. New York: National Industrial Conference Board, Inc., 1931.

This volume was prepared by a group of industrial physicians and executives in charge of the health departments in various leading industries. The survey was undertaken primarily to determine the costs of such service, the number of persons engaged in it, and its efficiency. The book includes a description of a standard dispensary and the records of service in handling physical examinations, industrial accidents and illnesses. There is also a chapter on medical work in the small plant, on the keeping of records, and an analysis of the work of various medical departments. In 1915, an investigation covering more than 220,000 workers in 41 plants showed an average cost of $0.88 per person annually for medical service; in 1917 a survey covering almost 500,000 employees in 99 plants revealed an average cost of $2.50 per person; in 1921 the annual cost had risen to $4.43 per employee, and in 1925 the cost was at least $5.14. In 1930, information supplied by 276 companies with almost 500,000 employees revealed an average annual cost per employee of $5.10 for medical service that consisted of a full time hospital with a trained nurse and well equipped dispensary where the management bore the whole of the cost. In twenty-seven companies whose employees contributed to the cost of medical service, some of which gave medical care to families as well as to employees, the annual cost was $12.11. Many varieties of plans exist and it is difficult to draw any definite conclusions from the study. The volume concludes with an outline for physical examinations, for first aid in various accidents and with a table of estimated values for services rendered. The book is a most useful guide.

Prophylaxe und Therapie der Infektionskrankheiten und Idiosynkrasien mit spezifischen und unspezifischen Mitteln. Von Dr. phil. et med. Bruno Busson, a. o. Universitätsprofessor, Vorstand der bundesstaatlichen Kontrollstelle im Serotherapeutischen Institut in Wien. Paper. Price, 18.60 marks. Pp. 237. Vienna: Julius Springer, 1932.

This is an excellent exposition of the point of view on these subjects of one of the foremost European students in this field. It goes even further than its title indicates, for the author does not hesitate to sketch in bold strokes the essential etiology and pathology of many of the conditions discussed. It clarifies, unifies and explains much that is puzzling to the uninitiated; and it cannot be studied, even by one who is well versed in these subjects, without adequate return for the time invested. The meagerness of the bibliography and the absence of an index are obvious faults.

Fertility and Sterility in Marriage: Their Voluntary Promotion and Limitation. By Th. H. Van de Velde, M.D. Translated by F. W. Stella Browne. Cloth. Price, $7.50. Pp. 448, with illustrations. New York: Covici, Friede, Inc., 1931.

This is the third volume in the series by Dr. Van de Velde which has had such wide distribution. He presents the combination of an interesting, almost romantic, writer with a social philosopher and scientific physician. Concerning certain factors of sex life he is exceedingly positive, among others, that sex abstinence in marriage is harmful both to the minds of the participants and to the success of the marriage. He realizes also that contraceptive methods may be abused. The introduction of his book is a careful consideration of various regulations of the Catholic Church on this subject, quoting many social and church documents. He then considers family limitation in its national, international and racial aspects, and in its individual aspects. The appendix to this section quotes many aphorisms by important writers. The next section of the book deals with the physiology of reproduction and the promotion of pregnancy, in which, as in previous books, the author describes in considerable detail the mechanisms of coition. He also discusses sterility in women, impotence in men, and artificial fertilization. Final chapters of the book deal with the prevention of conception. Here again Van de Velde concerns himself with the chemical, mechanical and other methods that have been used for this purpose. The conclusion of the book is a consideration of surgical sterilization and the use of radium and the x-rays. The thesis which has formed the motif of these three volumes is the belief of the author that sex is the basis of marriage and that, therefore, increase of knowledge toward this end is desirable. The British edition of the book even goes so far as to provide the names of the dealers in London who have for sale the various materials referred to by the author.

Manipulative Surgery. By A. S. Blundell Bankart, M.A., M.Ch., F.R.C.S., Orthopaedic Surgeon to the Middlesex Hospital. Modern Surgical Monographs. Edited by G. Gordon-Taylor, O.B.E., M.A., F.R.C.S. Cloth. Price, 7/6. Pp. 150, with 21 illustrations. London: Constable & Company, Ltd., 1932.

This small volume treats the subject of manipulative therapy in a concise, practical, easily understood manner. The author is an authority on the subject, being one of the leading orthopedic surgeons of the British Isles. He has written this book not for the trained orthopedic surgeon but chiefly for the general practitioner, who sees so many of these cases. The general practitioner is in keen competition with those who employ only manipulate therapy, especially the osteopath and the chiropractor. The author's purpose is to put into the general practitioner's hands a practical means of dealing with the common conditions that are amenable to manipulative therapy. In persuance of this purpose he has succeeded. The illustrations, though few, are excellent in character and reproduction. The author criticizes osteopathy and chiropractic in general vigorously, and rightly so.

Chemistry of Food and Nutrition. By Henry C. Sherman, Ph.D., Sc.D., Mitchill Professor of Chemistry, Columbia University. Fourth edition. Cloth. Price, $3. Pp. 614, with 32 illustrations. New York: Macmillan Company, 1932.

This practically rewritten edition, presenting the principles and scientific foundation of the chemistry of foods and nutrition, deserves an enthusiastic welcome. The subject is concisely discussed in a simple manner that conveys a good general understanding of this field. Food is considered chiefly in its relation to nutrition; detailed description of individual foods is omitted to advantage. The food requirements of man and considerations essential to development of good judgment on the nutritive value of foods and their choice and use for the maintenance and advancement of health are prominent features of the plan of presentation. The text is excellently balanced in its treatment of the four main factors of nutrition—energy, protein, mineral elements and vitamins. New material and data and several new chapters are incorporated. Valuable reference lists for supplementary reading accompany the chapters. Tables on the edible organic nutrients, ash constituents and vitamin content of individual foods are appended. This edition excels the past excellent editions in organization and presentation of subject matter and is an epitome of best opinion and judgment on the science of nutrition and general chemistry of foods. The writer is a master in his field. All directly or indirectly interested in foods and nutrition will want to study this book from cover to cover.

Ikonographia urologica. Im Auftrage der Deutschen Gesellschaft für Urologie. Herausgegeben von Alfred Rothschild, Victor Blum und Friedrich Necker. Lieferung 4. Paper. Price, 5.40 marks. Pp. 21, with 25 illustrations. Berlin: Georg Stilke, 1932.

This volume consists of a number of colored plates as well as black and white illustrations of a variety of genito-urinary lesions. The illustrations are accompanied by a short abstract of the case together with the urologic manifestations and the histopathologic diagnosis. The plates are excellently reproduced.

Medicolegal

Facial Paralysis Following Operation

(Brant v. Sweet Clinic (Wash.), 8 P. (2d) 972)

The Sweet Clinic is a corporation "engaged in Lewis county in the business of surgery for profit." Pursuant to the recommendation of the head surgeon of the clinic and another surgeon in its employ, one of the plaintiffs was operated on at the clinic for the removal of a growth or branchial cyst from the left side of her neck. When her husband visited her about seven hours after the operation, he observed that "her eye was out of shape and her face was drooped down . . . and her mouth, and she could only wrinkle up her forehead half way." According to his testimony, he at once consulted the head surgeon of the clinic, but he could get no information as to the cause of the trouble. The head surgeon did tell him, he testified, that his wife's face would never come back to normal. The patient and her husband sued the Sweet Clinic and others, and in the trial court obtained a judgment against them. The Sweet Clinic and the other defendants thereupon appealed to the Supreme Court of Washington.

The Sweet Clinic and its associated defendants contended that there was no evidence that the facial nerve of the patient was severed and that if it was severed there was no proof of negligence, as there were other causes for the paralysis. The defendant physicians claimed that they operated at a point below and posterior to the parotid gland and not within an inch of the point where the facial nerve emerges from the foramen. A physician who operated on the plaintiff about six months after the operation at the clinic testified, however, that he dissected down through the scar tissue of the first operation, into the parotid gland, and found there the severed ends of the nerve, separated by from a half-inch to an inch. His attempt to unite them failed. All the medical expert witnesses, except one who had assisted in the first operation, testified that the facial nerve would not be cut if a surgeon performing such operation as was performed exercised reasonable skill and care.

It may be a correct medical theory, said the court, that paralysis that is not observed until thirty-six hours or longer after an operation, gradually becomes more pronounced until the fifth day, and then improves, results from infection, edema, or hemorrhage of adjacent parts of the body within the site of the operation. In the present case, however, there was testimony that the paralysis was discovered seven hours after the completion of the operation, that it was then complete paralysis, and that it has remained complete ever since. There was undisputed competent testimony, too, that when paralysis immediately follows such an operation as was performed and is complete, the paralysis results only from a severance of the facial nerve. The evidence warranted the jury in finding that the appellant surgeon severed the facial nerve of the patient in the performance of an operation for the removal of a cyst, that he failed to exercise such reasonable skill and care as are ordinarily exercised in his profession, and that as the result of his negligence his patient's face was paralyzed.

It was contended that the appellant, the Sweet Clinic, being a corporation, could not practice surgery and therefore could not be held to respond in damages for malpractice by one of its surgeons. This contention, said the Supreme Court, is without merit. The Sweet Clinic is a corporation carrying on a medical and surgical business for profit and is liable for the malpractice of its operating surgeons, who in the present case were employees of the corporation. The judgment in favor of the patient and her husband was affirmed.

Workmen's Compensation Acts: Refusal to Submit to Operation.—An employee suffered a hernia as the result of an industrial accident. He refused to submit to an operation, proffered by the employer, to cure the condition. This refusal, contended the employer, deprived the employee of his right to recover compensation for the continued disability. Generally, said the court of appeal of Louisiana, Orleans, if an employee refuses to submit to an operation to remedy a condition caused by an industrial injury, and if that operation is ordinarily not dangerous, the employee cannot recover compensation for the disability which would be avoided by the operation. If, however, the proffered operation is fraught with any danger, his refusal will not bar his right to compensation. In this case, the employee was afflicted with chronic bronchitis and was subject to violent fits of coughing. A medical witness, called by the employee, testified that he would not operate under the existing circumstances. A medical witness called by the employer testified that chronic bronchitis might make an operation for hernia dangerous. It cannot be said, concluded the court, that an operation in this case would not be dangerous and the employee, therefore, was justified in refusing to submit to it and is entitled to adequate compensation.—*Flanagan v. Sewerage & Water Board (La.), 140 So. 83.*

Workmen's Compensation Acts: Dermatitis Caused by Continued Exposure to Oil Not Compensable.—The Oklahoma workmen's compensation act authorizes compensation for disability attributable to a disease, if that disease results from an accident. Compensation for an occupational disease is not authorized. An employee, in the course of his employment, was required to stand or wade in oil and was brought into contact with the vapors arising from oil. In the course of time his skin became irritated and a dermatitis developed on both feet, extending upward practically half way between the knees and the hip joints. In the opinion of the only medical witness testifying at the hearing before the industrial commission, this employee's disability was the result of an occupational disease. The Supreme Court of Oklahoma therefore vacated an award of the industrial commission, in favor of the employee, and remanded the case to the commission with directions to dismiss the proceedings.—*Imperial Refining Co. v. Buck (Okla.), 7 P. (2d) 908.*

Workmen's Compensation Acts: Fee of Medical Expert Taxable as Costs.—An employee who recovers compensation for an industrial injury is entitled to have the fee of a medical expert, called on his behalf, taxed as costs of the proceedings which the employer must pay.—*Chatman v. Companía de Navegacao, Lloyd Brasileiro (La.), 140 So. 141.*

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, November 2-4. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American College of Surgeons, St. Louis, October 17-21. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Public Health Association, Washington, D. C., October 24-27. Dr. Kendall Emerson, 450 Seventh Avenue, New York, Acting Executive Secretary.

American Society for the Study of Disorders of Speech, St. Louis, November 25-26. Dr. Samuel D. Robbins, 419 Boylston Street, Boston, Secretary.

American Society of Tropical Medicine, Birmingham, Ala., November 16-18. Dr. Henry E. Meleney, Vanderbilt University School of Medicine, Nashville, Tenn., Secretary.

Association of American Medical Colleges, Philadelphia, November 14-16. Dr. Fred C. Zapffe, 5 South Wabash Avenue, Chicago, Secretary.

Associated Anesthetists of the United States and Canada, New York, October 17-21. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association of Military Surgeons of the United States, Hartford, Conn., October 20-22. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Clinical Orthopedic Society. Chicago, November 10-12. Dr. E. B. Mumford, Chamber of Commerce Building, Indianapolis, Secretary.

Inter-State Postgraduate Medical Association of North America, Indianapolis, October 24-28. Dr. W. B. Peck, 12½ East Stephenson Street, Freeport, Ill., Managing Director.

New York State Association of Public Health Laboratories, Albany, November 4. Miss M. B. Kirkbride, New Scotland Avenue, Albany, Secretary.

Porto Rico, Medical Association of, San Juan, December 9-11. Dr. P. Morales Otero, 12 O'Donell Street, San Juan, Secretary.

Radiological Society of North America, Atlantic City, November 28-December 2. Dr. Donald S. Childs, Medical Arts Building, Syracuse, New York, Secretary.

Southern Medical Association, Birmingham, Ala., November 16-18. Mr. C. P. Loranz, Empire Building, Birmingham, Secretary.

Virginia, Medical Society of, Richmond, November 1-3. Miss Agnes V. Edwards, 1200 East Clay Street, Richmond, Secretary.

Western Surgical Association, Madison, Wis., December 9-10. Dr. Frank R. Teachenor, 306 East Twelfth Street, Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

50: 351-510 (July 15) 1932

*Effect of Castration on Capacity of Hypophysis to Induce Ovulation. J. M. Wolfe, Nashville, Tenn.—p. 351.

*Effects of Exercise Carried Through Seven Generations on Weight of Musculature and on Composition and Weight of Several Organs of Albino Rat. H. H. Donaldson and Ruth E. Meeser, Philadelphia. —p. 359.

Changes in Teeth Following Hypophysectomy: I. Changes in Incisor of White Rat. I. Schour and H. B. van Dyke, Chicago.—p. 397.

Observations on Bone Weights: II. Bones of Foot. N. W. Ingalls, Cleveland.—p. 435.

Capacity for Independent Self-Differentiation Exhibited by Isolated Primordia of Rabbit Embryo Transplanted to Omentum. A. J. Waterman, Boston.—p. 451.

Effect of Castration on Hypophysis.—Wolfe describes experiments in which he demonstrated that the removal of the ovaries of female rats causes hypertrophy of the anterior lobe of the hypophysis, associated with an increase in its capacity to induce ovulation in the rabbit. In the female rabbit, there is no appreciable hypertrophy of the anterior lobe after castration, and no increase in the capacity of the anterior lobe to induce ovulation. The author suggests that the presence or the absence of a mechanism for the release of certain anterior-lobe sex hormones may play a definite part in the reaction of the anterior lobe to castration.

Effects of Exercise for Seven Generations.—Donaldson and Meeser point out that in both sexes of the albino rat exercise causes most of the organs to become larger, but that the thyroid and the liver are less enlarged than in the controls. The enlargement is most marked in the gonads, kidneys, suprarenals, heart and submaxillary glands. The weight of the brain is increased only about 2 per cent, so that lack of exercise in the albino does not explain the large deficiency (12 to 14 per cent) in the weight of the brain, as compared with that of the wild Norway. Sex differences in response are shown by the thymus, by the calcification of the bones and possibly by the spleen. These weight changes in the organs are caused mainly by changes in the size of the formed cells. The response is, in a measure, limited. The changes in the organ balance following a slight amount of exercise before 56 days of age are marked, and they are but moderately increased by exercise continued for five months or more. There is no cumulative effect of exercise from generation to generation.

American Journal of Ophthalmology, St. Louis

15: 589-682 (July) 1932

Some Biologic Principles Which Underlie Ophthalmic Plastic Surgery. E. B. Spaeth, Philadelphia.—p. 589.

*Monocular Cycloplegia for Control of Myopia. W. H. Luedde, St. Louis.—p. 603.

Some Theorectical and Practical Points Regarding Unilateral Voluntary Winking. R. W. Danielson, Denver.—p. 611.

*Notes on Muscle and Fusion Training and Orthoptic Treatment of Motor Anomalies. O. Wolfe, Marshalltown, Iowa.—p. 618.

Technic of Preparing for Cataract Operation. E. Oláh, Gyula, Hungary. —p. 626.

Convenient Device for Using Artificial Pupils of Different Sizes. C. E. Ferree and G. Rand, Baltimore.—p. 632.

Monocular Cycloplegia for Control of Myopia.—On the basis of the hypothesis that progression of myopia may result from tension of the extra-ocular muscles during prolonged convergence in near work, Luedde treats this condition by dissociating the eyes for near vision through monocular cycloplegia. He gives a detailed report of one case in which the patient was treated thus over a period of eight years. The treatment was successful in checking progression in all cases during the time of its use.

Muscle and Fusion Training.—Wolfe points out that many obscure eye conditions have a functional element. This functional element is a causative factor in producing nervous conditions and symptoms of eye strain. Orthoptic functional exercises, along with other treatment, are therapeutic measures of much merit. Direct retinal and cerebral stimulation are produced along with an unmeasurable amount of psychic effect.

American Journal of Physiology, Baltimore

101: 409-572 (Aug.) 1932

Some Criteria of Accuracy for Measurement of Osmotic Pressure of Colloids in Biologic Fluids. H. S. Wells, Nashville, Tenn.—p. 409.

Concentration and Osmotic Pressure of Proteins in Blood Serum and in Lymph from Lacteals of Dogs. H. S. Wells, Nashville, Tenn.—p. 421.

Passage of Materials Through Intestinal Wall: II. Osmotic Pressure of Colloids of Lymph from Lacteals as Measure of Absorbing Force of Intestine. H. S. Wells, Nashville, Tenn.—p. 434.

Respiratory Quotient of Brain. H. E. Himwich and L. H. Nahum, New Haven, Conn.—p. 446.

Studies on Magnesium Deficiency in Animals: II. Species Variation in Symptomatology of Magnesium Deprivation. Elsa R. Orent, H. D. Kruse and E. V. McCollum, Baltimore.—p. 454.

*Glycogenolytic Effect of Epinephrine on Skeletal Muscle. S. G. Major and F. C. Mann, Rochester, Minn.—p. 462.

Inhibition of Lactic Acid Formation in Brain and Kidney Tissue Produced by Intravenous Injection of Sodium Monoiodoacetate. J. Haldi, Ann Arbor, Mich.—p. 469.

Method for Measuring Elasticity in Vivo and Results Obtained on Eyeball at Different Intra-Ocular Pressures. Janet H. Clark, Baltimore.—p. 474.

Production of Functional Corpora Lutea by Direct Intrafollicular Injection of Extracts of Pregnancy Urine. M. H. Friedman, Philadelphia. —p. 482.

Circulatory Adjustments to Moderate Exercise in Normal Individuals, with Particular Reference to Interrelation Between Velocity and Volume of Blood Flow. L. B. Ellis, Boston.—p. 494.

Factors Influencing Anemia Development in Young Rats. Helen S. Mitchell, Battle Creek, Mich.—p. 503.

Studies in Motor Activity of Large Intestine: IV. Response to Autonomic Drugs. R. D. Templeton and H. Lawson, Chicago. —p. 511.

Attempt to Produce Spinal Cord Degeneration in Dogs Fed High Cereal Diet Deficient in Vitamin A: Incidental Development of Syndrome of Anemia, Skin Lesions, Anorexia and Changes in Concentration of Blood Lipoids. M. M. Suzman, G. L. Muller and C. C. Ungley, Boston.—p. 529.

Studies on Induction of Ovulation and Inhibitory Influence of Corpora Lutea on Ovulation in Rabbit. J. J. Jares, Rochester, N. Y.—p. 545.

Effects of Polarization of Nerve Fibers by Extrinsic Action Potentials. E. A. Blair and J. Erlanger, St. Louis.—p. 559.

Relative Absorption Rates of Dextrose and Levulose. G. E. Burget, P. Moore and R. Lloyd, Portland, Ore.—p. 565.

Is Levulose Converted to Dextrose in Process of Absorption from Intestines? G. E. Burget, P. Moore and R. Lloyd, Portland, Ore. —p. 570.

Effect of Epinephrine on Muscle Glycogen.—Major and Mann believe that the conflicting data concerning the effect of epinephrine on glycogen in muscles may be accounted for by the fact that various investigators have removed the specimens of muscle under the influence of different anesthetic agents, or because different amounts of the substance have been injected into the body by different routes. Their investigations were undertaken to determine the effect of epinephrine on glycogen in the muscle under the influence of an anesthetic agent (isoamylethylbarbiturate) which has little, if any, glycogenolytic action. Furthermore, the rate of injection was carefully controlled. Massive doses of epinephrine caused a marked decrease of glycogen in muscles. Doses of the substance as small as 0.00016 mg. for each kilogram for each minute caused definite glycogenolysis, whereas 0.000066 mg. for each kilogram of body weight each minute did not result in demonstrable alteration in glycogen. The former dose is not attended by elevation of the arterial blood pressure or diminution of limb volume.

American Journal of Public Health, New York

22: 795-894 (Aug.) 1932

Some Epidemiologic Aspects of Psittacosis. H. E. Hasseltine, Washington, D. C.—p. 795.

Contributions of Western Branch of Public Health. K. Emerson, New York.—p. 804.

A County Hospital Health Center. M. M. Davis and Mary Ross, Chicago.—p. 809.

Public Health Aims and Professional Services of Nursing: During Infancy, Preschool and School Ages. Hortense Hilbert, New York. —p. 819.

Significance of Bone Trabeculae in Treatment of Lead Poisoning: Lead Studies XVII. J. C. Aub, G. P. Robb and Elsie Rossmeisl, Boston.—p. 825.

Seasonal Incidence of Whooping Cough in United States. G. E. Harmon, Cleveland.—p. 831.

American Journal of Surgery, New York

17: 1-174 (July) 1932

*Pyopericarditis: Analysis of Cases Treated by Pericardiotomy. J. D. Bisgard, Chicago.—p. 1.
*New Modification for Injection Method of Arteriography (Injection in Refluence). M. Saito and K. Kamikawa, Nagoya, Japan.—p. 16.
*Method of Ventricular Puncture. A. S. Crawford, Detroit.—p. 20.
Significance of Laboratory Studies in Gastric and Duodenal Ulcers. J. W. Hinton and Sophie Frankel, New York.—p. 25.
Submucous Perineoplasty. W. W. Babcock, Philadelphia.—p. 28.
*Study of Twelve Hundred Cervices, Including Five Hundred and Eighty-Nine Case Histories, Thirty-Five Hundred Microscopic Sections and Gross Specimens of Twelve Hundred Biopsies. J. E. Davis, Ann Arbor, Mich.—p. 32.
Tuberculosis of Genito-Urinary Tract. C. H. Chetwood, New York.—p. 39.
Lipiodol Injection of Biliary Fistulas: Report of Case of Foreign Body in Gallbladder for Period of Eighteen Years. H. J. Shelley, New York.—p. 46.
Specific Technic for Treatment of Acute Perforated Appendicitis. F. B. Gurd, Montreal, Canada.—p. 52.
Relations Between Appendicitis and Pyelitis. J. K. Narat, Chicago.—p. 59.
Carcinoma of Appendix, in Girl of Twenty. W. E. Darnall and R. A. Kilduffe, Atlantic City, N. J.—p. 63.
Acute Appendicitis Caused by Foreign Bodies: Report of Case of Tooth Lodged in Appendix. K. A. Meyer and P. A. Rosi, Chicago.—p. 66.
*Diagnostic Sign of Chronic Appendicitis. M. W. Mettenleiter, New York.—p. 69.
Acute Peritonitis in Childhood. S. D. Lazarus, Brooklyn.—p. 70.
Reflex Spasm of Stomach and Duodenum Caused by Disease of Appendix. J. W. Thompson and O. Abel, Jr., St. Louis.—p. 74.
Spinal Anesthesia. L. M. Bogart, Flint, Mich.—p. 79.
Electrosurgery: Electricity in Medicine. G. E. Ward, Baltimore.—p. 86.
Results of New Method for Repair of Inguinal Hernia. H. Niessen, Frankfort-on-Main, Germany, and W. J. Potts, Oak Park, Ill.—p. 94.
Arteriovenous Aneurysm of Thyroid Vessels. J. J. Selman and S. O. Freedlander, Cleveland.—p. 99.
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Complete Loss of Female Urethra and Bladder Floor. B. A. Hayes, Oklahoma City.—p. 104.
Diverticulum of Jejunum: Case Report. S. K. Beigler, A. R. Bloom and J. Wruble, Detroit.—p. 109.
Migratory Colon: Case Report. R. C. Pendergrass, Americus, Ga.—p. 111.
Effect on Knee of Shortened Gastrocnemius Muscle. J. J. Nutt, New York.—p. 113.
Walking Cast for Affections of Lower Leg. L. V. Rush and H. L. Rush, Meridian, Miss.—p. 114.
Urethral and Vesical Aspirator. H. D. Furniss, New York.—p. 115.
Instrument for Elevating of New-Born Cranial Depressions. J. Browder, Brooklyn.—p. 116.

Pyopericarditis.—According to Bisgard, purulent pericarditis is essentially a complication of other diseases and is met principally in childhood and early adult life. That its presence has so frequently been unsuspected, until disclosed by postmortem section, would indicate a lack of due consideration of this complication. Quite consistently, characteristic clinical pictures and roentgen changes have been observed in all reported cases. Pericardiocentesis or exploration readily establishes the diagnosis. A consideration of the relative mortality rates of 45 per cent in cases in which surgical drainage was done and approaching 100 per cent in undrained cases presents no question for decision as regards treatment. Insufficient data have been accumulated to make a comparative evaluation of the various methods of drainage. The advantages of the airtight closed operation have been demonstrated experimentally, but unfortunately it is a rather blind procedure and does not permit exploration. The use of drainage material and irrigations in open drainage may be guided by the nature of the exudate and offending micro-organisms but it would seem highly desirable to avoid placing any foreign body within the pericardium. Reliance on the expulsive action of the constant motion of the heart and on postural drainage has proved as effective as any other method in the small group of patients so treated. The compiled reports contain surprisingly few cases with symptomatic evidence of resultant adhesive pericarditis or other heart damage.

Arteriography.—Saito and Kamikawa describe their new method of arteriography. The artery is exposed and an arterial clamp applied; then a certain amount of an opaque substance is injected at a point proximal to the arterial clamp, in refluence of the blood stream. This is called "arteriography in refluence" (l'arteriographie par injection ascendant, Arteriographie durch aufsteigende Füllung). By this method they have been able to visualize the arteries in the pelvic cavity, obstruction of the external iliac artery, and the collateral circulation in a patient with a large aneurysm of the subclavian artery. They believe that this injection method of "in refluence" will open the way for practical clinical visualization of the arteries of the trunk of the body, such as the subclavian artery, and the arteries in the pelvic cavity.

Ventricular Puncture.—Crawford points out that to see an experienced operator thrust a trocar free-handed into a lateral ventricle looks like a simple procedure and it often is as it appears. But there are circumstances under which it can become very difficult. Performing it without drapes facilitates the finding of the proper angle of approach by "sighting" the needle. But there are some who do not care to risk this method and its potential dangers of infection. He experimented with a number of different devices and found one that has proved satisfactory during the last five years. It consists of adjustable arms fastened to a head band and anchors directly to the skull by screwing into the trephine openings.

Study of Twelve Hundred Cervices.—Davis made histopathologic studies of approximately 3,500 sections of 1,200 cases from which biopsies were obtained, the material having been selected after certain clinical indications. There was abundant and convincing evidence in this material that the following conditions were essentials of the premalignant and malignant process: tissue injury; continued unremitting irritation to issue layers and cells; demobilization of tissue and cell relations; exposure of immature, incompletely differentiated cells to continued irritation and hyperphysiologic stimulation; newly produced cells with cessation of maturing ability in form and function beyond that of simple division, these cells in turn being of less mature appearance. The progeny of the basal cells in the stratified epithelium, when exposed to chronic inflammatory effects delivered from the stromal side, displayed the most frequently produced pictures of the beginnings of a malignant condition. The clinical symptoms of pain in the lower abdomen, leukorrhea, menstrual disorders and pain in the back prevailed in from 49 to 22 per cent of the cases in the order named as dominant complaints. The author believes that prevention of pathologic changes in the cervix is a most profitable field of therapeutic endeavor. In cases of laceration, erosion, ectropion, infection and ulceration, early and adequate attention yields almost a perfect score of cures and at the same time prevents cancer formation in from 90 to 100 per cent of cases.

Diagnostic Sign of Chronic Appendicitis.—For a number of years, Mettenleiter has paid particular attention to the condition of the abdominal wall in all cases in which complaints were made about pains in the region of the appendix. The examination is made by testing the thickness of the skin and the adipose tissue, on corresponding spots of the right and left sides between the anterior superior iliac crests, with the thumb and the index finger. In doing this one must be sure to grasp the same amount of tissue on the two sides; otherwise the comparison will be faulty. There is often a marked difference in the thickness of the two sides. The right side is decidedly thinner than the left one. Whenever this difference was found, the operation revealed pathologic changes of the appendix or of the cecum. It is understood that these conditions must have existed for some time to cause the difference in thickness. The difference is doubtless caused by a real atrophy of the subcutaneous tissue and the underlying muscle on the right side.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

13: 389-443 (July) 1932

Radiothermy (Fever Induced by Short Radio Waves). W. Bierman, New York.—p. 389.
Place of Diathermy in Cancer Problem. G. Kolischer, Chicago.—p. 401.
Pelvic Irradiation in Cancer of Cervix. P. Findley, Omaha.—p. 405.
Significance of Pathologic and Etiologic Factors in Treatment of Rheumatic Diseases. E. D. McBride, Oklahoma City.—p. 407.
Atrophic Rhinitis: Report of Case Treated by Negative Galvanism and Potassium Iodide. B. E. McGovern, Philadelphia.—p. 412.
Factors Determining Clinical Response to Ultraviolet Radiation. G. J. Warnshuis, Cedarburg, Wis.—p. 413.
Diathermy. H. E. Stewart, New Haven, Conn.—p. 421.
Ultraviolet in Practice of Stomatology. A. T. Rasmussen, La Crosse, Wis.—p. 424.

Georgia Medical Association Journal, Atlanta

21: 259-300 (July) 1932

Diverticulum of Duodenum. T. Harrold, Macon.—p. 259.
Addison's Disease: Report of Case. W. W. Daniel, Atlanta.—p. 264.
Birth Injuries to Cerebrospinal Nervous System. J. Akerman, Augusta. —p. 266.
Tumor of Sacrococcygeal Region. J. C. Sandison, Atlanta, and J. B. Brown, St. Louis.—p. 268.
Rectal Disease: Some Remote Manifestations. G. F. Eubanks, Atlanta. —p. 273.
Operative Treatment for Prevention of Diabetic Gangrene: Case Report. J. W. Daniel, Savannah.—p. 280.
Tumor of Brain and Trauma of Brain: Case Reports. E. F. Fincher, Atlanta.—p. 281.
Hexamine Treatment of Malarial Coma. R. L. Miller, Waynesboro. —p. 293.

Johns Hopkins Hospital Bulletin, Baltimore

51: 61-116 (Aug.) 1932

*Systemic Blastomycosis: Report of Case. T. S. Raiford, Baltimore. —p. 61.
*Tick-Bite Fever in Children. P. G. Shipley, Baltimore.—p. 83.
*Occult Syphilis: Neglected Factor in Diagnosis and Treatment. U. J. Wile, Ann Arbor, Mich.—p. 102.

Systemic Blastomycosis.—Raiford presents a case of systemic blastomycosis with primary involvement of the skeletal system. The features of the case were the widespread involvement of the bones, the absence of typical concomitant lesions, and the response to treatment with various drugs. He briefly reviews the literature; although many cases of blastomycoses have been reported, he found none bearing a distribution similar to his case. Although the bones are frequently the seat of the lesion, the majority of cases likewise show involvement of other organs. The pathologic lesions are similar to those of tuberculosis and chronic osteomyelitis of the bone with a marked degree of osteolysis and minimal new bone formation. The three conditions are frequently confused. The clinical features resemble those of any generalized infection and the nature of the disease is proved only by finding the organisms in the pus from the sinuses, or in biopsy specimens from the soft tissue. Prognosis is uniformly poor and advanced cases almost invariably terminate fatally. The treatment consists of proper hygienic measures, supplemented by certain types of drugs, among which potassium iodide, ethyl iodide and gentian violet are most efficacious.

Tick-Bite Fever in Children.—Shipley reports that there are six case histories of children ill with tick-bite fever in the files of the Harriet Lane Home of the Johns Hopkins Hospital. Of these, three were boys and three were girls. The ages of the patients range from 3 to 11 years. There was a direct history of being bitten by ticks in two instances, but all six had been exposed in infested areas. Of the two patients who were bitten, one was bitten on the occiput, and the offending tick was removed from the external auditory meatus of the other. The incubation period is short. In three patients it could not be determined; in one it was four days. The boy from whose ear the tick was removed complained of the symptoms of general infection on the same day that he noted the presence of the invader in his ear. This boy, however, came from a heavily infested area and there are two possibilities of error in dating the infection: first, that the tick may have bitten him elsewhere before it was noticed in the ear canal, and, second, that the latter may not have been the offending tick. The patient with the longest incubation period had removed from the infested neighborhood to town nine days before he gave up and went to bed with a swollen cervical lymph node, headache and vomiting. He had been noticed to be somewhat apathetic, however, and to have been pale and drawn when he returned from the country, where he complained of headache and vomiting before leaving. He was severely ill and is the only child who may be said to have had prodromal symptoms. Some of the patients with tick-bite fever have apparently infected themselves by crushing between their fingers ticks which they have picked off their dogs. While one thinks at once of minute abrasions and scratches as the portal of entry in these individuals, it is probably not necessary to postulate their existence, since the virus of the Rocky Mountain spotted fever has been shown to pass through intact epithelium.

Occult Syphilis.—Wile defines occult syphilis as that form of infection the lesion of which does not reach the clinical horizon. It may possibly be as well spoken of as the subclinical manifestations of the disease. By this it must not be assumed that the subclinical manifestations are in any way less serious than those which present themselves as clinical entities. On the contrary, in many cases the subclinical manifestations may constitute the major portion of the morbid processes and may be the salient factors in the prognosis of the given case. Their recognition is essential to its proper management. Of great interest in connection with the occult nature of syphilis in women is the large group of cases in which no manifestations of the disease have been recognized and in which clinical examinations fail to reveal preexistent or existent causes for a positive biologic reaction. Such are the cases of syphilis occurring in many women in whom the infection existed in the husband in a latent or partially treated case of some duration before marriage. It is the present custom to regard all such cases as potentially dangerous and requiring as energetic treatment as if the infection were seen as a fresh case from the outset. Such a procedure is probably wise, but it cannot be gainsaid that the majority of these patients if untreated could go through many years of apparently normal existence carrying no sign of the disease other than that which occurs in the blood. In view of the well known mimicry of syphilis, the diagnostic problem is often delicate. This is particularly true in cases of syphilis presenting hepatic disease, gastric disease, splenic anemia, hyperthyroidism and aortic regurgitation. Few cases of nephritis can be shown to be related to coexisting syphilis; syphilis and hypertension, when related, are more apt to be casual than causal, and this is true also of diabetes. Occult syphilis has been shown to be a factor of importance in the development of carcinoma when this occurs in squamous epithelium but is apparently unrelated when malignant neoplasms develop from columnar epithelium.

Journal of Lab. & Clinical Medicine, St. Louis

17: 951-1070 (July) 1932

Studies on Structure and Function of Bone Marrow: I. Variability of Hematopoietic Pattern and Consideration of Method for Examination. R. P. Custer, Philadelphia.—p. 951.
Id.: II. Variations in Cellularity in Various Bones with Advancing Years of Life and Their Relative Response to Stimuli. R. P. Custer and Florence E. Ahlfeldt, Philadelphia.—p. 960.
Neutrophilic Graph. R. J. Needles, Detroit.—p. 962.
Age of Leukocyte in Relation to Infection. T. Fitz-Hugh, Jr., Philadelphia.—p. 975.
Study of White and Differential Counts in Six Unselected Cases of Inoculation Malaria. G. A. Winfield, Cleveland.—p. 985.
Review of Granulocytopenia (Agranulocytosis). R. R. Kracke, Atlanta. —p. 993.
Present Status of Study and Treatment of Leukemia. R. Isaacs, Ann Arbor, Mich.—p. 1006.
Treatment of Anemias. C. C. Sturgis, Ann Arbor, Mich.—p. 1010.
*Studies on Patients with Pernicious Anemia Treated with Massive Doses of Liver Extract: II. Effects on Reticulocytes, Red Cells, Hemoglobin and White Cells. J. E. Connery and L. J. Goldwater, New York.—p. 1016.
Simple Apparatus for Transfusion of Blood by Citrate Method. R. L. Haden, Cleveland.—p. 1027.
Reactions of Blood Transfusion: Observations from Twenty-Five Hundred Transfusions, with Review of Literature. S. H. Polayes and M. Lederer, Brooklyn.—p. 1029.
Special Features of Blood in Infancy and Childhood. S. M. Goldhamer, Ann Arbor, Mich.—p. 1043.
Diagnostic Features of Blood Count and Morphology of Blood in Diseases Associated with Splenomegaly. H. Z. Giffin, Rochester, Minn. —p. 1050.
*Blood Picture in Hyperthyroidism and Hypothyroidism. E. P. McCullagh and J. H. Dunlap, Cleveland.—p. 1060.

Pernicious Anemia.—Connery and Goldwater treated fifteen pernicious anemia patients with single or repeated massive doses of liver extract, with or without transfusion. Data are presented on the effects on reticulocytes, red cells, hemoglobin, white cells, blood sugar and blood pressure. The reticulocytes responded promptly in the complicated as well as in the uncomplicated cases. Two cases showed no reticulocyte response, one because of a previous reticulocyte peak and the other because of the high level of the red cells at the time of treatment. The magnitude of the reticulocyte response seemed to depend on the initial level of the red cells and the presence or absence of complications. Within the limits of the dosage used, the size of the dose seemed to bear no relationship to the promptness of the reticulocyte response, the height of the reticulocyte peak or the duration of increased reticulocyte activity. Transfusion seemed to have no effect on the promptness, magnitude or duration of the reticulocyte response. From

the type of the reticulocyte response it was impossible to predict the subsequent course of the red cells. The increase in red cells bore no relationship to the size of the dose given or to the original level of the red cells but did seem to be influenced by the presence of complications. The course of the hemoglobin in general paralleled that of the red cells. Increase in white cells was noted in several cases, with or without shift to the left. Increases in some cases were associated with decrease in lymphocytes and increase in polymorphonuclear leukocytes. In one instance there occurred a shift to the left with no increase in the total number of leukocytes. The occurrence of a leukocytosis, with or without shift to the left, could not be regarded as a favorable prognostic sign. Cases that presented the lowest initial leukocyte counts had the most favorable course. The administration of from thirty to fifty vials of liver extract was without significant effect on blood sugar or blood pressure.

Blood Picture in Hyperthyroidism and Hypothyroidism.—McCullagh and Dunlap present a report based on a study of 1,200 routine blood counts made in consecutive cases of hyperthyroidism. Differential counts were made in 250 of these cases. The report includes routine counts made in seventeen cases in which death followed uncomplicated hyperthyroidism and in fifty-one cases in which postoperative hypothyroidism occurred. It was noted that in hyperthyroidism the red blood cell count is normal but there is a slight reduction of hemoglobin. There is a relative lymphocytosis which is of some diagnostic value. The relative lymphocytosis is dependent on two factors in the blood: (1) the absolute lymphocyte rise and (2) the total leukocyte count. The total leukocyte count was found to be variable, the variation being due, chiefly, to the variation in the neutrophils. There is a greater lymphocytosis, therefore, in the presence of leukopenia. In twenty-eight cases examined while the metabolic rate was high, and again after operation, the average lymphocyte count was found to be lowered by operation. In the majority of cases there was a fall in the relative number of lymphocytes present. In the series of twenty cases counted apart from the routine counts, 50 per cent of the cases showed an absolute increase of lymphocytes postoperatively (counted from four days to one and one-half months postoperatively), and 50 per cent showed an absolute decrease. All showed a relative decrease. The degree of lymphocytosis on one estimation is not an index of the severity of the hyperthyroidism. The hemoglobin in hyperthyroidism is reduced slightly as in hypothyroidism. The degree of relative lymphocytosis in hypothyroidism is about as high as that in hyperthyroidism. The average nonfilament count in ten cases of hypothyroidism, was higher than that in ten cases of hyperthyroidism.

Journal of Preventive Medicine, Chicago

6: 249-339 (July) 1932

Physical Impairments of Adult Life: Association with Subsequent Rates of Mortality. R. H. Britten, New York.—p. 249.
*Permanence of Mild Type of Smallpox. C. V. Chapin and J. Smith, Providence, R. I.—p. 273.
*Is the "Appalling Increase" in Heart Disease Real? C. F. Bolduan and N. W. Bolduan, New York.—p. 321.
*Examination of Pooled Human Serum for Its Neutralizing Effect on Poliomyelitis Virus. N. P. Hudson and E. H. Lennette, Chicago.—p. 335.

Permanence of Mild Type of Smallpox.—Chapin and Smith point out that the mild strain of smallpox has prevailed over vast regions of the United States for over thirty years. It has continued in an enormous number of lines for hundreds of "generations" and still maintains its early characteristics. Cases of this mild strain of smallpox, like those of most contagious diseases, exhibit many minor variations, but without the development of a permanent new type. The variations in the disease can scarcely be due to anything else than variations in the pathogen, what biologists call "fluctuating variations." The authors have been unable to find any evidence that the mild strain has ever reverted to the classic type; that is, that the pathogen of the disease has ever undergone a mutation in that direction. It is true that there have been in this country many outbreaks of the severe classic type. Some have occurred every year. They have been most numerous near the Mexican border or at seaports. A large number of these outbreaks of the severe strain have been definitely determined to have arisen from importations. Many more, probably, had such an origin. Most American health officers and epidemiologists who have had experience with the two types of smallpox do not think that as yet there has been any reversion of the mild strain to the old classic strain.

Increase in Heart Disease.—The Bolduans state that in New York City, for the population as a whole, there is no evidence of any increase in the real death rate from heart disease. The registered rise in the death rate from heart disease is largely, if not wholly, fictitious. Statistics based on the registered deaths from heart disease alone are fallacious. Deaths registered under apoplexy, arterial disease, kidney disease and senility must be taken into account. The great prevalence of cardio-arteriorenal disease presents an important health problem. Its solution demands accurate statistics. In the United States registration area as well as in New York City the specific death rates even in the higher age group have declined since the beginning of the century, a fact that it is difficult to reconcile with any considerable increase in the mortality of heart disease.

Neutralization of Poliomyelitis Virus.—Ten specimens of pooled serum from city-dwelling adults and from persons of various ages convalescent from poliomyelitis were tested by Hudson and Lennette for their neutralizing effect on the poliomyelitis virus. The numbers of individuals contributing to the pools varied from five to fifty. All specimens manifested neutralizing properties when the serum was undiluted and frequently when examined in dilutions of 1:5 and 1:25. This type of biologic technic does not allow for exactitude in interpreting comparative titers when the differences are so small as were demonstrated by the two types of serum in these experiments. The authors believe that the research laboratory can function to advantage in cooperation with clinical investigations into the efficacy of therapy in poliomyelitis with serum from convalescents and so-called normal adults. Further inquiry is necessary to determine whether there is any relation between the possible benefits in serum therapy and the experimental capacity of serum to neutralize the effect of the virus.

Medical Journal and Record, New York

136: 45-88 (July 20) 1932

Headaches Associated with Digestive Disorders. J. Friedenwald and T. H. Morrison, Baltimore.—p. 45.
Cinchophen Poisoning in a Diabetic with Induction of Hypoglycemia: Report of Case. S. S. Berger and H. H. Schweid, Cleveland.—p. 50.
Mountain Cedar Hay Fever. I. S. Kahn, San Antonio, Texas.—p. 54.
Modern Conception of Deafness. H. Hays, New York.—p. 55.
X-Rays. H. Goodman, New York.—p. 57.

Michigan State M. Society Journal, Grand Rapids

31: 509-560 (Aug.) 1932

Embryohormonic Relations of Endocrine Glands: I. Embryohormonic Relations of Thyroid Gland to Ectodermal Tissues. R. C. Moehlig, Detroit.—p. 525.
Ascaris Lumbricoides Infestation in Children in Oakland County. H. R. Roehm, Birmingham.—p. 531.
Omphalocele Congenitalis. J. W. Gordon, Detroit.—p. 533.
Vincent's Angina: Case of Lung Abscess and Interlobar Empyema Following Extraction of Tooth Under Gas Anesthesia. A. A. Farbman and J. C. Danforth, Detroit.—p. 535.
Intraperitoneal Therapy. R. W. Teed, Owosso.—p. 537.
Bilateral Optic Neuritis and Electric Retinitis: Report of Two Cases. R. W. Hughes, Detroit.—p. 538.
Gallbladder Disease and Diabetes. C. D. Brooks, W. R. Clinton and L. B. Ashley, Detroit.—p. 539.
Michigan's Department of Health. C. C. Slemons, Lansing.—p. 542.

New Orleans Medical and Surgical Journal

85: 83-152 (Aug.) 1932

The Intern Year. C. J. Miller, New Orleans.—p. 83.
*Acute Intestinal Obstruction. C. F. Dixon, Rochester, Minn.—p. 87.
Indications and Methods of Blood Transfusion. W. K. Irwin, Baton Rouge, La.—p. 97.
Small Doses of Roentgen Rays in Treatment of Inflammatory Conditions. A. Granger, New Orleans.—p. 103.
Clinical and Social Aspects of Vulvovaginitis in Children, with Outline of Special Method of Treatment. J. T. Witherspoon, New Orleans.—p. 108.
Some Clinical Concepts of Heart Failure. S. M. Copland, New Orleans.—p. 113.

Acute Intestinal Obstruction.—According to Dixon, pain of a cramping, colicky nature, vomiting, and later shock and collapse are the principal features of acute intestinal obstruction. In acute abdominal diseases of an inflammatory nature, tender-

ness, rigidity, or both, are commonly present. In acute obstruction of the intestine, these signs are usually absent. A flat roentgenogram of the abdomen in cases of obstruction contains the shadows of the distended, gas-filled, segmented loops. Gas is not normally present in the small intestine in sufficient quantities to cause distention. In pyloric obstruction, the loss of gastric juice seems the chief causative factor for the alterations found in blood chemical values. In intestinal obstruction there is also a loss of gastric juice, but in addition there is apparently a toxic substance, of a protein nature, that is absorbed by the obstructed bowel. In pyloric obstruction, then, toxemia is apparently due to chemical deficiency and, in intestinal obstruction, to chemical deficiency together with absorption of toxic substances. The greatest life saving factor in acute intestinal obstruction is early operation. The author suggests multiple enterostomy.

Ohio State Medical Journal, Columbus

28: 489-552 (July) 1932

Intestinal Diverticula. G. L. Lambright, Cleveland.—p. 509.
Treatment of Varicose Ulcers. R. S. Gillette, Toledo.—p. 512.
Intraspinal and Intravenous Anesthesia. C. R. Steinke and H. V. Sharp, Akron.—p. 514.
Ptosis. F. F. Lawrence, Columbus.—p. 516.
Lifting the Curse by Removing Cause of Epidemic Diseases. H. C. Temple, Alliance.—p. 518.
Diagnosis and Treatment of Uterine Inertia: Report of One Hundred Cases. M. Garber, Cleveland.—p. 521.
Perforated Peptic Ulcer. W. M. Johnston, Akron.—p. 523.

Oklahoma State Medical Assn. Journal, Muskogee

25: 323-368 (Aug.) 1932

Active Immunization Against Diphtheria: Need for Improvement over Present Methods of Attaining It. F. C. Neff, Kansas City, Mo. —p. 323.
Diphtheria. G. H. Garrison, Oklahoma City.—p. 326.
Present Status of Alimentary Intoxication of Infants. B. H. Nicholson, Oklahoma City.—p. 329.
"Some Causes of Malnutrition." C. W. Arrendell, Ponca City.—p. 334.
Ringworm and Its Allied Eruptions. D. G. Duncan, Oklahoma City. —p. 338.
Further Study of Thyroid Problems. M. O. Shivers, Colorado Springs, Colo.—p. 340.
Causation and Management of Simple Goiter. J. W. Hendrick, Amarillo, Texas.—p. 348.
Some Phases of Hyperthyroidism. J. F. McAlester.—p. 353.

Public Health Reports, Washington, D. C.

47: 1509-1551 (July 15) 1932

Sickness Among Male Industrial Employees During First Quarter of 1932. D. K. Brundage.—p. 1509.
Observations on Agglutination of Proteus X Organisms in Rocky Mountain Spotted Fever. G. E. Davis.—p. 1511.

West Virginia Medical Journal, Charleston

28: 337-384 (Aug.) 1932

*Present View of Problem of Chronic (Nonspecific) Arthritis, with Particular Reference to Etiologic and Therapeutic Comprehensiveness. S. R. Miller, Baltimore.—p. 337.
Conservative Treatment of Head Injuries. W. Freeman, Washington, D. C.—p. 348.
The Commoner Rectal Ailments. J. R. Brown, Huntington.—p. 352.
Organic Lesions in Neurotic Patient. W. V. Wilkerson, Montgomery. —p. 355.
Etiology and Prevention of Heart Disease. W. D. Simmons, Glen Ferris.—p. 358.
Changes in Refraction in Diabetes Mellitus. H. McGrath, Montgomery.—p. 360.

Chronic Arthritis.—According to Miller, two types of chronic arthritis, the atrophic and the hypertrophic, are sharply to be differentiated from a large group of arthritis of specific or known etiologic origin. These two types may not only be readily recognized in their fully developed clinical manifestations but predicted in a relatively high percentage of individuals with predispositional stigmas that are forewarning signals. The etiologic factors that adversely influence the predisposed individual are multiple and there is much to refute the current thought that infection alone is the sole and attackable factor, particularly in the atrophic type. An equal amount of evidence points to the view that hypertrophic arthritis is seldom due to infection. The same therapeutic measures which are to be comprehensively employed in the treatment of a well established case apply with equal effectiveness in the theoretical prevention of these diseases of admitted serious economic importance.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 87-128 (July 16) 1932

*Observations on Treatment of Trigeminal Neuralgia: Alcohol Injection or Operation. W. Harris.—p. 87.
*Dislocation of Patella. S. A. S. Malkin.—p. 91.
Treatment of Chronic Suppurative Disease of Middle Ear. J. D. McLaggan.—p. 94.
Significance of Urinary "Proteose" in Idiopathic Epilepsy. R. L. H. Minchin.—p. 97.
Treatment of Malignant Disease by Pituitrin and Theelin. W. Stewart. —p. 98.
Pyloric Stenosis of Congenital Type Associated with Tetany in a Woman of Sixty-Eight. G. M. Wauchope.—p. 100.

Treatment of Trigeminal Neuralgia.—It is now about twenty years since Harris's first papers on this subject were published. In this interval his experience of many hundreds of cases has confirmed his view of the advantages which successful gasserian injection has over any open gasserian operation. In those cases of ganglion injection in which he has injected the inner portion of the ganglion and left the third division with full sensation, should recurrence of the pain happen a further injection should be as easy as on the first occasion, as the sensory guide of the third division is unimpaired. He has frequently heard the statement repeated that, though the first alcohol injection may be satisfactory for a time, a second injection is of no use. This is quite untrue except when injections have been so frequent that a condition of fibrosis in the zygomatic fossa has been set up, which renders manipulation of the needle difficult; there is no possibility of the nerve becoming immune to alcohol. In such fibrotic cases it is particularly impossible to make injections satisfactorily, and the open root-section operation is then the only remedy. In a certain proportion of other cases it will no doubt be found impossible to obtain satisfactory ganglion anesthesia, and root section will probably be required sooner or later; but in a large proportion of cases of trigeminal neuralgia it will be found possible to obtain deep or total ganglion anesthesia, probably in over 80 per cent either by the route through the sigmoid notch or by the longer anterior route. Anesthesia that has persisted unaltered for a month after injection of the ganglion may be considered permanent and unlikely to diminish to any marked extent.

Dislocation of Patella.—Malkin states that dislocation of the patella is predisposed by the erect posture and may be due to imperfect development of a recently acquired function of the quadriceps. It results from an abnormality which may be present in (1) the muscle itself, (2) the articular surface of the femur, and (3) the attachment of the patellar tendon to the tibia. A satisfactory and simple method of correcting this is to displace the muscle and its tendon inward and to transplant the tibial tuberosity in such a way that the patella is brought down below its normal position. This insures stability and enables the quadriceps to work with the maximum of efficiency.

Lancet, London

2: 165-224 (July 23) 1932

*Rôle of Glucose in Treatment of Diabetic Intoxication. H. P. Himsworth.—p. 165.
*Value of Endoscopic Methods in Upper Air Passages. V. E. Negus. —p. 169.
*Experimental Production of Kidney Lesions by Diet. W. Cramer. —p. 174.
Some Roentgen-Ray Observations in Varicose Disease of Leg. T. H. T. Barber and A. Orley.—p. 175.
Immunization with Potent Unconcentrated Diphtheria Toxoid. R. A. O'Brien and H. J. Parish.—p. 176.
*Addison's Disease Successfully Treated by Cortical Suprarenal Extract: Case. T. Thompson and B. F. Russell.—p. 178.
Anesthesia and Analgesia in Normal Labor Cases: One Year's Experience at Maternity Hospital. A. M. Claye.—p. 180.

Dextrose in Treatment of Diabetic Intoxication.—The principle of the method of treatment of diabetic intoxication used by Himsworth is that the essential therapeutic agent in this condition is dextrose, and that unless this substance is present in sufficient amounts, insulin is relatively impotent. Insulin, of course, must be given, but the fundamental idea is to give dextrose, covered by the necessary amount of insulin—not insulin covered, if necessary, by dextrose, as is the current

practice. The patient is first put to bed and kept warm. Water is allowed freely and every three hours he is given 25 units of insulin subcutaneously, and fifteen minutes later 50 Gm. of dextrose in solution by mouth. Specimens of urine are obtained just before each injection of insulin, catheterization being necessary if the patient will not pass urine voluntarily. When first seen the urine will give a positive dark red ferric chloride reaction, which is usually accompanied by a copious white precipitate of phosphates; the more delicate nitroprusside reaction for acetone bodies will be positive and will become blue-black on standing, and sugar will usually be present in sufficient amounts to reduce Benedict's qualitative solution completely. As the patient comes under treatment, the following sequence of urinary changes occurs in every case: 1. The white precipitate given by ferric chloride either does not occur or comes down in greatly diminished amounts. 2. The ferric chloride reaction becomes negative. 3. The nitroprusside reaction becomes negative. 4. The urine becomes sugar free. As soon as the patient is passing urine which contains only a trace of sugar and no ketone bodies he should be put on a light diet of about a third of his normal calorific requirement. This should be made up almost exclusively of carbohydrate, divided into three main meals, and insulin given so that every 3 Gm. of carbohydrate is covered by 1 unit. In addition, between meals and three hours after the evening meal, 30 Gm. of dextrose and 10 units of insulin should be given. The author presents a table that shows the type of diet used and the arrangement of the meals. The patient will remain acetone free under this regimen, and after from twenty-four to forty-eight hours the dextrose, with its covering insulin, should be stopped and the diet increased so that every unit of insulin is covered by 4 Gm. of carbohydrate. If, prior to this, fat is included in the diet, even in small amounts, ketones will again appear in the urine in considerable quantities. The final adjusting of the diet and insulin dosage may then be entered on. Recovery occurs with such automatic regularity that the minimum of supervision is required and the physician may to some extent consult his own convenience. When this method of giving dextrose covered by insulin, and not insulin covered by dextrose, is used, not only are blood sugar estimations unnecessary but, if performed, their significance is entirely fictitious.

Endoscopic Methods in Upper Air Passages.—Negus presents examples from ninety-five patients in an attempt to illustrate the great value of endoscopic methods applied to the air passages. At least twenty-eight patients subject to most dangerous complaints were cured, while none were harmed. Of the remainder, twenty-six were improved, some to a marked extent; eleven were unchanged. In twenty-one a diagnosis was called for and made. Six patients died in spite of treatment. Of seventy-two patients for whom bronchoscopy was used as a means of treatment, and not merely for diagnosis, a total of twenty-eight cured and twenty-six improved was gratifying, considering the variety and unpromising nature of many of the conditions.

Experimental Production of Kidney Lesions by Diet.—In experiments on rats kept on synthetic diets in which the proportion of inorganic salts in the salt mixture was varied so as to produce a mineral imbalance, Cramer found that the omission of magnesium salts from the salt mixture produced extensive degenerative lesions in the glomeruli and tubules of the kidney. The experiments were carried out with the original intention of studying the biologic effect of a mineral imbalance between magnesium and calcium ions, since it is known from other evidence that there is a biologic antagonism between these two ions. It was expected that the diminution in the intake of magnesium ions would lead to a preponderant effect of the calcium ions and would produce a more extensive calcification of the kidney. This, however, did not occur. The extensive degenerative changes in the tubules and glomeruli, which were found instead, are surprising and unexpected. The theoretical significance of these observations lies in the fact that it is possible to produce experimentally such degenerative changes by dietetic measures which do not involve the introduction or formation of toxic substances but which appear to result from a mineral imbalance, having a specific effect on the glomeruli and tubules of the kidney. It is of interest to note that clinically the administration has been used in recent years with good results in the hemorrhagic nephritis of children in order to ward off uremic convulsions or to cut them short when they have set in. In the former case large quantities have to be given by the mouth or by rectum every four hours. In comatose patients or in those with convulsive twitchings, the action is not sufficiently rapid and the intramuscular injection of a 25 per cent solution of magnesium sulphate in doses of about 0.2 cc. per kilogram of body weight is recommended. The administration of magnesium sulphate produces a fall of blood pressure and cessation of cerebral symptoms. It is a curious fact that even such massive doses of magnesium sulphate do not produce diarrhea in children with the hemorrhagic type of nephritis. The observations recorded by the author appear to warrant a more extensive use of magnesium sulphate in the treatment of certain types of nephritis.

Addison's Disease.—Thompson and Russell report a case of Addison's disease in which the administration of cortical suprarenal extract in a crisis so severe that death appeared to be imminent was followed by recovery. They emphasize the fact that although response to cortical hormone in crisis is dramatic, treatment must be continued indefinitely in most cases. Dextrose and physiologic solution of sodium chloride intravenously is of great help in crises, to combat dehydration and low blood pressure. In the authors' patient the severe asthenia and the pigmentation are controlled by the continuous administration of cortical suprarenal extract. On the other hand the blood pressure remains depressed and the blood sugar low; in spite of this the patient is now able to lead a normal life.

Medical Journal of Australia, Sydney

2: 1-33 (July 2) 1932

*Electrocoagulation of Tonsils: Some Clinical, Pathologic and Bacteriologic Observations. R. G. Brown and J. V. Duhig.—p. 1.
Review of One Hundred and Fifty Consecutive Autopsies on the Insane, with Especial Reference to Relation of Physical Lesions to Mental Symptoms. A. B. Anderson.—p. 8.
*Some Observations on Prognosis in Acute Nephritis. I. M. McPhee and G. Kaye.—p. 14.

Electrocoagulation of Tonsils.—Brown and Duhig refute the statements made by certain enthusiasts of diathermy destruction of the tonsils. For some time they have been and are still satisfied that total removal of the tonsils by electrocoagulation can be performed almost painlessly and with practically no subsequent discomfort, but only provided a little destruction is done at each sitting. Likewise, satisfactory results can be expected only when the operator possesses a thorough knowledge of the anatomy of the tonsil and its surroundings and has the necessary expert skill to manipulate the electrode and to manage his patient.

Prognosis in Acute Nephritis.—McPhee and Kaye present statistics of ninety cases of acute nonscarlatinal nephritis. The highest incidence and least immediate mortality were in the first decade of life. The incidence was almost the same in the second decade of life; the mortality was slightly greater. Cases were less frequent in the later decades, but the mortality was much greater. Uremic symptoms were present in 14.4 per cent of the acute cases, and when death occurred it was uremic in nature. Uremia was more fatal in patients older than the second decade of life. Evidence of nitrogen retention was found more often than was expected, even when edema was present and no uremic manifestations occurred. Approximately half of the patients had albuminuria more than four weeks after the beginning of the acute attack. The value of persistent albuminuria as a prognostic sign is discussed. No frequent etiologic factor could be assigned. Tonsillitis, possibly coincidental, was present in 19 per cent of the patients. Apart from uremia, basal congestion of the lungs was the commonest complication. Pleurisy, pneumonia and cardiac decompensation were also recorded. No patient died as a result of these complications.

Tubercle, London

13: 481-528 (Aug.) 1932

Carbohydrate Common to Group of Acid-Fast Organisms, Including Tubercle Bacilli. A. Branch.—p. 481.
Presence of Tubercle Bacillus in Milk. S. R. Gloyne.—p. 488.
Bactericidal Action of Ultraviolet Irradiations on Tubercle Bacilli. E. Mayer and M. Dworski.—p. 500.
R_1 Strain of Tubercle Bacillus: Record of Forty Years' Experience with Attenuated Organism. L. U. Gardner.—p. 504.

Annales des Maladies Vénériennes, Paris

27: 1-80 (Jan.) 1932

*Treatment of Inguinal Lymphogranulomatosis by Injections of Glycerin into Lymph Nodes. M. Pinard and P. Robert.—p. 1.
Mandibulary Syphilis. M. Dechaume.—p. 4.
Gonococcal and Nongonococcal Blennorrhagia. G. Franck.—p. 16.

Treatment of Inguinal Lymphogranulomatosis.—Pinard and Robert have successfully treated inguinal lymphogranulomatosis by injection of glycerin into the infected lymph nodes. The treatment consists in opening the buboes, removing the fungoid growths from the cavity with a curet and injecting 2 cc. of sterile glycerin into the opening. This procedure is performed daily. When the wound has closed up so that it admits only a small quantity of glycerin, the glycerin is injected with a large needle directly into the lymph node. Suppuration starts to decrease a few days after the first injection and the closing of the wound progresses at the same rate as drainage decreases. The healing of the treated buboes is accompanied by a decrease in volume of the deep iliac adenopathies, even though one is limited to intervention on the inguinal lymph nodes. This method of treatment seems more rapid than some of the others; it is not especially painful, and it can be employed by any practitioner.

Archives Méd.-Chir. de l'App. Respiratoire, Paris

7: 201-280, 1932

Bronchial Asthma and Aerial Electricity. R. A. Brandan.—p. 201.
Anatomopathologic Technic in Etiologic Diagnosis of Exudates. J. E. Morin.—p. 221.
Diagnosis of Dermoid Cysts of Mediastinum. E. Sergent.—p. 233.
*Interlobar Fusospirochetosis and Fusostreptococcicosis. G. Delamare, C. Gatti and R. Jimenez Gaona.—p. 239.

Fusospirochetosis and Fusostreptococcicosis.—Delamare and his associates think that the scarcity of pleural fusospirochetosis as opposed to the frequency of fusospirochetosis of the bronchopulmonary parenchyma is more apparent than real. They report a case of fusospirochetal infection of the left interlobar fissure in a syphilitic patient aged 42 with a chronic cough. The onset was mild. The chief clinical symptom consisted in febrile attacks alternating with apyretic intervals of gradually increasing length. Puncture in the region of pain yielded a fetid pus with innumerable spirochetes and some fusiform bacilli. The fusiform bacilli were absent in a later aspiration but reappeared in small numbers later. The patient died after seven months from a thoraco-abdominal phlegmon. Necropsy confirmed the existence of a suppurating pocket in the left interlobar fissure with no apparent communication with the bronchi. Histologic examination revealed marked pleuropulmonary sclerosis of long standing and microbic accumulations in the bronchioles consisting of fusiform bacilli, spirochetes and streptococci. The fusospirochetal broncho-alveolitis was characterized by the absence of parenchymatous necrosis and evidently originated from the pleural fusospirochetosis. The authors report a case of fusostreptococcicosis of the left interlobar fissure which was clinically similar to the fusospirochetosis. The onset was accompanied by tachypnea, tachycardia and chills, absent in the other case, and by more acute pain. In both cases the pus was fetid from the start and remained fetid. The interlobar determination was preceded by chronic bronchorrhea in the first case, postanesthetic bronchitis in the second, and in both cases pleuritis of the large cavity with little or no exudate, origin of the pachypleuritis which finally covered the entire surface of the inferior lobe of both patients. The long duration of the disease and the alternation of short febrile attacks with long apyretic intervals is one of the major characteristics of interlobar fusospirochetosis and interlobar fusostreptococcicosis. Anatomically, the sclerosing nature of the infections was the most important characteristic. The temporary dissociation of the Vincent's symbiosis in the first case, due to tracheal elimination of the fusiform bacilli and pleural elimination of the spirochetes, is important in interpretation of cases in which one or the other of the two bacteria is missing. Practically these two cases give the key to the etiology of certain deep suppurations with intermittent fever and to certain pleuropulmonary scleroses. Theoretically they complete the heretofore fragmentary data on the spirochetes of pleural effusions.

Policlinico, Rome

39: 1353-1388 (Aug. 29) 1932. Practical Section

Exanthematous Fever, Fièvre Boutonneuse, or Aberrant Benign Typhus? G. Pecori.—p. 1353.
*Surgical Treatment of Artificial Anus. F. Iovino.—p. 1357.
Echinococcosis of Extrahepatic Biliary Tract. G. Picardi.—p. 1361.
Case of Circumscribed Empyema with Double Sac Simulating Echinococcus Cysts. G. Serafini.—p. 1364.

Surgical Treatment of Artificial Anus.—Iovino distinguishes between extraperitoneal and intraperitoneal methods of surgical intervention for artificial anus. Extraperitoneal operations on the spur, orifice, or both are seldom harmful but frequently unsuccessful. They can be remedied by enterectomy or entero-anastomosis. They impede the intestinal canalization which can be seriously threatened by cicatricial retraction of the wall of the organ, especially if the plastic operation on the intestine results in a small retracted lumen. Another drawback is that the method attempts an intestinal suture on insufficient material deprived of a healthy peritoneum. Autoplastic operations and sutures with or without the enterotomy of Le Dentu (kenterotomy) are often unsuccessful. No matter how far the interparietal dissection of the loop can be pushed up, the fibrous layer which unites the parietal to the intestinal peritoneum is never resected, because it would have to pass into the open peritoneum, into a healthy zone. Furthermore, the sutures include a sclerosed intestinal segment not strong enough to support them and through which they tear easily with resulting spontaneous perforations. In addition there are always adhesions of the occluded segment and of the small intestine to the abdominal wall. These adhesions harden, and the only way to avoid them is closure by the intraperitoneal route. The author next discusses the intraperitoneal methods: lateral enterorrhaphy, enterectomy, entero-anastomosis. The ideal intraperitoneal operation is resection of the loop involving the artificial anus and circular suture of the two ends of the intestine. If deep adhesions render extirpation difficult, intestinal exclusion may be applied; indications of exclusion are due to contraindications of resection. Simple anastomosis is least harmful and most rapid. Lateral enterorrhaphy is reserved for cases in which the loss of intestinal substance is less extensive, where a single intestinal orifice exists without diverticula, where the fistulous loop is slightly adherent and easily separated from the wall and where the intestinal wound may be sutured without fear of stenosis. If the loop is badly injured and the ends are divergent, enterectomy is preferable. Likewise in anus with spur, if enterorrhaphy is not done before enterotomy according to Dupuytren, one should resort to a simple enterectomy. In lateral anus without spur, single enterorrhaphy is often sufficient, especially if it deals with the large intestine in which there is enough tissue to insure a strong suture and no danger of stenosis. This method is advisable when the small intestine is involved. The author's case concerns intraperitoneal treatment, enterectomy followed by suture. Autoplastic means had been unsuccessfully used previously.

Medicina Ibera, Madrid

1: 305-336 (Sept. 3) 1932. Partial Index

*A New Sign for Diagnosis of Position of Fetus in Uterus in Transverse Presentation with Appearance of Arm in Labor. L. Barcala Moro.—p. 315.

Sign for Diagnosis of Position of Fetus.—Barcala Moro emphasizes the importance of the diagnosis of the position of the fetal head and back in the uterus in cases of labor complicated by a transverse presentation of the fetus with appearance of the arm of the fetus, in order to determine the conduct of labor to be followed in the given case; that is, whether to follow a conservative treatment (version of the fetus) or a radical treatment (embryotomy). The author describes with illustrations the new sign. It consists in the study of the hand of the fetus in supination. If the bones of the forearm are parallel at palpation, the hand is in supination. If they are crossed, the hand is in pronation. To place the hand in supination, it is turned so that the bones of the forearm are parallel. Once the arm is in supination, the position of the hand will indicate the position of the fetus in the uterus. The side on which the fetal head is located in the uterus is indicated by the side on which the thumb is. The position of the dorsum of the hand indicates the position of the back of the fetus in

the uterus. If the dorsum of the fetal hand points upward when the parturient woman is in the dorsal position, the fetal back is in the anterior position, while if the dorsum of the fetal hand points downward while the parturient woman is in the dorsal position, the fetal back is in the posterior position. The sign is simple, of great use, and entirely reliable. It has the advantages on other classic methods for diagnostic purposes that it does not demand the performance of a vaginal manual examination, and it gives in a rapid and simultaneous form the diagnosis of the position of both the head and the back of the fetus.

Wiener Archiv für innere Medizin, Vienna

22: 321-479 (July 15) 1932

*Studies on Primary Hypertonia. L. Popper.—p. 321.
*Pathogenesis of Increased Blood Pressure in Persons with Nephritis. M. Georgopoulos.—p. 367.
Action of Carotid Sinus Reflexes on Blood Pressure in Human Beings. M. Mandelstamm and S. Lifschitz with assistance of O. Ellenbogen and A. Schafran.—p. 397.
Action of Ocular Reflexes (Aschner's Eyeball Pressure Test) on Blood Pressure. M. Mandelstamm and S. Lifschitz with assistance of O. Ellenbogen and A. Schafran.—p. 435.
Analysis of Rare Conduction Disturbances in Human Heart. M. Winternitz.—p. 445.
*Amidopyrine in Diabetes Insipidus. D. Scherf.—p. 457.
Loss of Hair in Poisoning with Thallium. V. Koszler.—p. 473.

Studies on Primary Hypertonia.—Popper reports observations in more than 1,000 cases of hypertonia. In 754 patients the hypertonia was primary, in 56 it was toxigenic, and 231 cases could not be definitely classified. He considers primary hypertonia as an hereditary, familial disease. It is occasionally observed in young persons and usually affects the pyknic type. Characteristic aspects are eccentric hypertrophy of the left ventricle, hypertonic arteries, and occasionally renal changes in the form of arteriosclerosis. Hypertension, that is, increased pressure in the vascular tube, may be absent. The height of blood pressure is not an indication of the degree of hypertonia. The patient with hypertonia is endangered by fluctuations in the blood pressure, particularly by sudden pressure increases. Eccentric cardiac hypertrophy is not a sign of beginning decompensation, because it already exists in young persons with hypertonia, and it is a result of the adaptation to the changed circulatory conditions. In the toxigenic form of hypertonia, the cardiac hypertrophy is concentric. The configuration of the apex of the heart is especially significant in the differentiation. The involvement of the kidney is secondary in patients with primary hypertonia. Arteriosclerosis was detected in 75 per cent of the cases that came up for postmortem examination. Death in uremic coma is extremely rare in primary hypertonia. A large percentage of the patients had cerebral attacks, some of which were fatal. Sclerosis of the basal cerebral vessels was noted in 55 per cent of the cases in which postmortem examination was made. The author further directs attention to the significance of pulse differences in the radial arteries and to vascular changes in the retina. The latter, according to Guist, reveal characteristic differences between primary and toxigenic hypertonia. Yet there is also a relationship between primary and toxic hypertonia in that primary hypertonia predisposes to the toxic form. The author also discusses the relation of primary hypertonia to other internal diseases, such as nephritis, vascular and cardiac disorders, tuberculosis, tumors, syphilis, and disturbances of the liver, biliary tract and pancreas, and to gastrointestinal ulcer and febrile diseases. For the treatment of primary hypertonia he recommends psychotherapeutic, dietary and medicinal measures. Because pressure fluctuations are to be avoided, he advises against phlebotomy.

Pathogenesis of Increased Blood Pressure in Persons with Nephritis.—Georgopoulos discusses and criticizes the theories of the pathogenesis of increased blood pressure in patients with nephritis which have been advanced by others and also describes his own experiments and clinical observations. He refutes the theory in which the blood pressure increase in patients with nephritis is considered as a compensatory process and as a result of the reduction of the renal secretory surface. He sees the cause of the increased blood pressure in the generalized anatomic changes in the small vessels and in the more difficult circulation resulting from this. He considers the changes in the renal vessels as a partial manifestation of the generalized vascular disorder. He does not exclude the involvement of a functional factor, namely, of a vascular spasm, in the genesis of hypertension, but he considers it as a secondary disturbance in the diseased vessels. The greater difficulty of the circulation, which is due to the changes in the renal vessels, the author considers important in the pathogenesis of high blood pressure; but, without increased resistance in other parts of the vascular system, he does not think it capable of producing a great increase. He considers that the retention of water and of other substances that are normally present in the urine is likewise of some importance in the hypertension of persons with nephritis.

Amidopyrine in Diabetes Insipidus.—In four of five patients with diabetes insipidus Scherf effected a considerable decrease in thirst and a reduction in the diuresis by administering large doses of amidopyrine either orally or intramuscularly. He also observed that when the amidopyrine is given for a long period its efficacy decreases, but if it is discontinued for a while and then again administered it is once more effective. As soon as the medication with amidopyrine is discontinued, the diuresis increases greatly and the retained sodium chloride is eliminated. In estimating the therapeutic value of amidopyrine in diabetes insipidus, the author points out that, although it is harmless and much lower in price than the hypophyseal preparations that are employed in diabetes insipidus, it will not entirely replace them because the decreased water elimination is accompanied by a considerable sodium chloride retention. Another disadvantage is the fact that amidopyrine loses its efficacy in prolonged medication. However, in cases in which it appears advisable to effect a temporary reduction in the secretion of urine, and particularly in cases in which severe thirst is to be counteracted (persons with carcinoma of the esophagus or with pyloric stenosis), the intramuscular injection of 0.5 Gm. of amidopyrine proves helpful. At present the action mechanism of amidopyrine is not understood.

Zeitschrift für klinische Medizin, Berlin

121: 231-514 (Aug. 3) 1932

Noncharacteristic Infections and Their Position in Nosologic System. F. O. Höring.—p. 231.
Infection of Duodenum with Blastomycetes and Blastomycoses. A. Meyer.—p. 247.
*Mechanism of Decompensation and Stasis. H. Baumann.—p. 263.
Phosphorus Fractions of Blood in Renal Diseases. K. Hoesch.—p. 305.
*Maturation of Surviving Reticulocytes: Estimation of Daily Hemoglobin Production. L. Heilmeyer and R. Westhäuser.—p. 361.
Thrombosis and Embolism. H. J. Schulte.—p. 380.
Renal Disease in Bence-Jones Proteinuria. W. Ehrich.—p. 396.
Electrocardiograms with Shortened Atrioventricular Distance and Positive P Deflections. M. Holzmann and D. Scherf.—p. 404.
Changes in Electrocardiogram Produced by Injection of Adenosin Phosphoric Acid. W. Hartmann.—p. 424.
Relative Size of Heart in Women Athletes. J. Král and B. Polland.—p. 447.
Alimentary Hyperglycemia in Exophthalmic Goiter and in Thyrotoxicoses. A. Mager.—p. 465.
Testing of Carbohydrate Metabolism in Exophthalmic Goiter. P. Kramer.—p. 472.
Threshold Value of Insulin. J. Bauer and J. Monguió.—p. 476.
*Clinical Significance of Hyperglycemia Produced by Solution of Pituitary. Berta Aschner and L. Jaso-Roldan.—p. 495.
Does Epinephrine Influence Sedimentation Speed of Erythrocytes and Fibrinogen Content of Blood? C. V. Medvei and J. M. Alpher.—p. 504.

Mechanism of Decompensation and Stasis.—Baumann defines cardiac decompensation and insufficiency. He designates as instances of decompensation only those cases in which the circulation even during rest is not equal to the requirements of the organism. The other cases in which the cardiac impairment becomes manifest only after exertion are considered as cardiac insufficiency. In decompensation the author differentiates between reparable cases in which the condition yields to therapy and irreparable cases in which it is refractory to all treatment. Since in irreparable decompensation anatomic causes are usually not detectable, extracardiac causes should be searched for. As the most important factor the author considers an increase in the total amount of blood. Since there is no method for the determination of the total amount of blood an attempt is made to calculate it from the minute volume and the average velocity of the circulation. The author devised a new method for the determination of the average velocity of the circulation. In calculating the total amount of blood

from the average velocity of the circulation and from the minute volume he detected in normal persons values between 11.4 and 17.3, and in persons with decompensation values up to 24. The total amount of blood is not increased in all cases of decompensation but primarily in cases of irreparable decompensation. In the cases of reparable decompensation the stasis is the essential factor. However, stasis is not a direct result of the changed cardiac dynamics, but it is the result of a discrepancy between the amount of blood entering and leaving the heart. The increase in the quantity of blood offered to the heart takes place as in normal persons by intravascular displacement of the blood. Thus the stasis develops quickly by active participation of the peripheral vessels. The stasis is overcome by a prolonged increased activity of the heart and by decreased requirements of the organism. But only as long as the blood depots function properly can stasis be successfully counteracted. The author concludes that the increase in the total amount of blood is the most important cause of the progressive circulatory weakness as well as of the failure of the usual treatment of circulation.

Maturation of Surviving Reticulocytes. — By means of incubation experiments in vitro, Heilmeyer and Westhäuser studied the decrease of reticulocytes together with the respiratory processes. In the first twenty-four hours they noted a marked reduction of the reticulocytes, while the total number of erythrocytes remained constant. In the time between the twenty-fourth and forty-eighth hours of incubation the reduction in the reticulocytes decreases, and during the same period there is a decrease in the respiratory processes up to cessation. In the decrease of the reticulocytes not all groups are affected in the same manner, but reticulocytes that on the basis of clinical observations must be considered as young forms disappear first, whereas the more mature forms survive the longest. The order of disappearance takes place in accordance with Heilmeyer's group classification. This proves that in the disappearance of the reticulocytes in the first twenty-four to forty-eight hours of incubation vital maturation processes are concerned. However, the decrease that is still observable on the third and fourth days is caused by postmortem processes of disintegration. Even when the cultures are kept at from 4 to 5 C., maturation of reticulocytes takes place. However, in this case it is much slower. What at 37 C. takes place in hours requires several days in the refrigerator. If the cultures are kept in the refrigerator, the respiratory processes are still demonstrable after many days; that is, at a time at which in the incubator the cells have long since died. At a low temperature the reticulocytes have a vita minima, during which all metabolic processes and also those of maturation and the blood sugar consumption are considerably retarded, but which also prolongs the life. The maturation time in vitro at 37 C. corresponds closely with that observed in vivo. On the basis of the number of reticulocytes and their maturation time the daily erythrocyte and hemoglobin production can be computed in healthy persons as well as in those with diseases of the blood. In healthy persons 200 billion erythrocytes containing 5 Gm. of hemoglobin are produced daily. Therefore all the circulating erythrocytes of a healthy person are replaced in 125 days. The figures obtained in this manner correspond, relatively even if not absolutely, with those obtained on the basis of elimination of urobilin, so that from the number of reticulocytes and from the maturation time the daily hemoglobin production can be estimated, and this method is at least as reliable as the estimation of the disintegration of the erythrocytes on the basis of the elimination of urobilin. In hemolytic icterus both methods indicate concordantly a tenfold increase in the destruction of the erythrocytes.

Clinical Significance of Hyperglycemia Produced by Solution of Pituitary.—Aschner and Jaso-Roldan point out that former experiments and observations have revealed that the administration of extract of the posterior lobe of the hypophysis causes in human beings as well as in animals a temporary increase in the blood sugar. It appears that this action of solution of pituitary is produced partly by mobilization of the epinephrine from the suprarenals and partly by direct mobilization of sugar from the glycogen reserves of the organism. The degree of hyperglycemia produced by solution of pituitary is dependent partly on the excitability of the sympathetic nervous system and partly apparently also on the intactness of the suprarenals, whereas the promptness of the reaction seems to be closely connected with the quantity of the readily available glycogen. In persons with hyperthyreosis the reaction is marked; in diabetic persons, however, the curve rises slowly, and because of the deficient counterregulation it remains for a considerable time at the maximum. No other characteristic changes in the blood sugar curve following the administration of solution of pituitary in endocrine disorders were detectable, and the authors consider the diagnostic value of the test as negligible.

Zeitschrift für Urologie, Leipzig

26: 521-592, 1932

Rare Causes of Renal Hemorrhages: Essential Hematuria and Nephralgia. R. Chwalla.—p. 521.
*Aspiration of Vesical Tumors Under Visual Control. O. Hennig and J. Lechnir.—p. 558.
Nephritis, Nephrosis, Uremia, Edema and Renal Function. K. Bujniewitsch.—p. 561.

Aspiration of Vesical Tumors Under Visual Control. —Failure of blind aspiration in cases of comparatively solid vesical tumors induced Hennig and Lechnir to attempt a new method in such cases; namely, aspiration under visual control. After giving an illustrated description of the instrument they employ and the manner in which it is used, they report their results. They found that aspiration under visual control has definite advantages in comparison with blind aspiration, for in the latter method it is more or less dependent on chance whether the instrument is in a favorable position with regard to the tumor. Although, in the case of papillomas, evacuation can be effected even if the instrument does not reach the tumor directly, in the case of the more solid tumors it is important that the opening of the instrument be pressed into the tumor. Another advantage of aspiration under visual control is that the direction of the current is only centrifugal. This not only prevents an ascending infection but also precludes the possibility of an inoculation of tumor tissues into injured mucous membrane. As the greatest advantage of aspiration under visual control the authors consider the considerable reduction in the time required for treatment, particularly of the more solid tumors, which formerly required suprapubic cystotomy or frequent endovesical coagulations. Whereas endovesical coagulation of solid papillomas may require twenty and more treatments, aspiration under visual control usually has to be done only once.

Zentralblatt für Gynäkologie, Leipzig

56: 1985-2048 (Aug. 13) 1932

*Anesthetization of Head's Zones to Counteract Pain in Gynecologic Disorders. B. Kriss.—p. 1986.
Solid Large-Cell Ovarian Carcinoma in Pseudohermaphrodism. E. Klaften.—p. 1989.
Psudomalignant and Apparently Inoperable Papillary Ovarian Tumors. G. Baksct.—p. 1996.
Clinical Aspects of Melanoma of Vulva. A. W. Hochloff.—p. 2001.
Changes in Blood and Their Effect After Acute Hemorrhage. E. Tonkes. —p. 2003.
Clinical Aspects and Transplantation of Uterine Tubes into Inguinal Canal. W. Walz.—p. 2007.
Artificial "Hour Glass Vagina" as Prolapse Operation in Old Women. H. Rotter.—p. 2010.
Spontaneous Rupture of Uterus in Premature Birth. Cause: Chorio-Epithelioma. G. Cohn.—p. 2013.

Local Anesthetization to Counteract Pain in Gynecologic Disorders.—Kriss discusses the nervous mechanism of Head's zones and shows how such a zone can be detected. After localizing the zone of hyperalgesia, one introduces a needle into the center of the area to be anesthetized and advances it up to the fascia. Then from 5 to 10 cc. of the anesthetic solution is injected subcutaneously at four points around the center, so that the area enclosed by the points of injection forms a rhombus. As the anesthetic the author employs a 0.5 per cent solution of procaine hydrochloride. Shortly after the injection slight paresthesia sets in, but after a short time the pain disappears. This method was found helpful in women with abdominal and lumbar pains. It was resorted to in 200 cases, in over 70 per cent of which adnexal changes were present. It was found helpful particularly in chronic adnexal disorders, whereas in acute cases it was frequently ineffective. The author recommends this method to counteract the pain in chronic disorders of the adnexa, as well as in hyperesthesia of the abdominal wall and of the lumbar region.

Sovetskaya Klinika, Moscow

17: 127-278, 1932

Medical Faculty of University of Moscow in Eighteenth Century. G. A. Kolosov.—p. 127.
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*Kidney-Bean Extract with Properties Similar to Insulin. M. A. Lyass and V. L. Vovsi.—p. 241.
New Ideas in Theory of Sensation. L. G. Chlenov.—p. 244.
Present Status of Surgery of Sympathetic Nervous System. F. I. Yanishevskiy.—p. 265.

Kidney-Bean Extract with Properties Similar to Insulin.—Lyass and Vovsi experimented with kidney-bean extract on rabbits and men in order to prove its glucokinin properties and the solubility of its toxic compounds. They demonstrated that the administration of a large dose of this extract to the animals produces an increase in the sugar content of the blood, removes glycogen from the liver, and generally causes death. A small dose, however, is ineffective in reducing the amount of sugar. Therefore they used their own method to eliminate the toxic properties from the extract. The method employed was similar to that of Collip and Dudley and resembled that used for obtaining insulin from the pancreas. The extract was mixed with diluted alcohol, evaporated at 40 C. and at an optimal p_H solution. By this method the authors released the extract from mixtures of albumins and lipoids. Experiments performed on normal rabbits with a large dose of their extract revealed a considerable decrease of sugar content in the blood, whereas impure extract produced the opposite effect. The same occurred in patients. It was found that a maximum decrease of sugar occurred in the urine and the blood between the second and third hours after administration, while at the end of the fourth hour these fluids reassumed their former character. The four hour experiment on diabetic persons who received 50 cc. of the pure extract under proper diet and a four hour fast revealed a decrease of the sugar content. The authors conclude that their preparation possesses glycolytic properties and as such may eventually replace insulin.

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*Simple Achylic Anemia. H. A. Salvesen.—p. 817.
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*Simultaneous Occurrence of Multiple Neurofibromas and Diffuse Gliomatosis in Membranes of Spinal Cord and Brain—on Hereditary Basis. F. Harbitz.—p. 841.
Experimental Encephalomyelopathy in Rabbit After Intravenous Injection of a "Smooth" Form of Bacillus Influenzae Pfeiffer, Cultivated from Patient with Meningitis. M. Tesdal.—p. 849.
Traumatic Emphysema Reported in Old-Egyptian Medical Papyrus. B. Ebbell.—p. 860.
Bodily Types. C. Schiøtz.—p. 865.

Simple Achylic Anemia.—In Salvesen's 207 cases of gastric achylia, fifty-two (25.1 per cent) of the patients had hemoglobin values of from 20 to 82 per cent. Of the fifty-two, only four were in men. Most of the women were between 40 and 49. He states that almost one half of all women in this age group with achylia are anemic. Women between 30 and 39 constitute the next most liable age group, while of his twenty-two cases of achylia in women over 59 none had anemia. Achylic anemia is secondary anemia with low color index; a certain leukopenia may occur. Erroneous diagnosis of this anemia is frequent. Treatment with iron is effective, massive doses usually being required. Arsenic and liver are without avail. Two cases, in sisters, with pronounced anemia and considerable enlargement of the heart, in which all the symptoms yielded to treatment with iron, are described; also a case of calcium hunger and one with marked dysphagia, glossitis, and koilonychia.

Fall from Great Height: Rupture of Heart.—A man, aged 28, fell from the fourth floor to the ground; death was almost immediate. On necropsy a rupture about 9 cm. long, parallel to the axis of the heart, was found in the left ventricle of the heart; the edges were sharp and without extravasation of blood. The diaphragm was perforated. Berner states that the left ventricle is the part of the heart most often ruptured (Fischer and Pressel); the rupture is explained by hydrodynamics. In this instance the possibility of a bone fragment as the cause of the rupture of the diaphragm and heart was excluded, the rupture of the diaphragm occurred where the heart in its upright position rests on the diaphragm, the patient fell on his chest, and the thorax, because of the fracture of the clavicles and of ribs on the left side, may be assumed to have been comparatively easily pushed in from above downward and toward the spinal column; he therefore concludes that the heart caused the rupture of the diaphragm and then directly afterward was itself ruptured, owing to the pressure. There was a fracture of the base of the cranium and particularly of the frontal bone, and typical Duret's lesions were seen with hemorrhages both in the lateral ventricles and in the fourth ventricle, and characteristic ecchymosis over the left nucleus caudatus. In the brief duration of life after the trauma, hemorrhages had not time to become visible in the frontal lobes, where the trauma was most severe. In the author's opinion this case agrees perfectly with Duret's experimental work. The only ground for dispute is whether the mechanics are as assumed by Duret.

Multiple Neurofibromas and Diffuse Gliomatosis in Spinal Cord and Brain.—Harbitz sees in this case in a boy who died at the age of 9, after four years' hospitalization, a threefold special interest. 1. The hereditary basis was marked; the child was the sixth of a family of nine, of whom the five oldest had multiple neurofibromas, and Recklinghausen's disease in the mother, then 19, was described by Harbitz in 1908. 2. In addition to the peripheral neurofibromas the patient had gliomatosis in the central nervous system, with the starting point probably in the cauda equina, and these two tumors are regarded as an outcome of the same constitutional factor, the case thus connecting neurofibromas in the peripheral nerves with gliomatosis in the central nervous system. 3. The diffuse extent of the tumor masses in the thin membranes of the spinal cord and the brain was so pronounced that the entire spinal cord and medulla oblongata seemed to be cast in tumor masses.

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Harmine, New Agent Against Extrapyramidal Muscular Stiffness. S. Petersen and K. Winthner.—p. 727.
*Tuberculosis and Pregnancy: Résumé. K. Westh.—p. 730.
*Three Cases of Poisoning with Nitrobenzene. H. Bjerre.—p. 733.
Ovarian Cyst Infected with Bacillus Paratyphosus B. A. Bojesen.—p. 734.

Tuberculosis and Pregnancy.—Westh presents evidence that prognostically favorable forms of tuberculosis are not aggravated by pregnancy; in the prognostically uncertain forms, the results of interruption of pregnancy and conservative treatment counterbalance. In the bronchogenic cases with poor prognosis, the condition might perhaps be favorably influenced by early interruption of pregnancy. From the author's observations of 107 gravidas followed from 1924 to 1930 he concludes that pregnancy is without danger for certain forms of tuberculosis and that in other forms a causal connection between gravidity and aggravation temporarily coincident with pregnancy cannot be established. In the majority of apparently dangerous forms of tuberculosis, therapy can be effectively carried through without interruption of pregnancy.

Poisoning with Nitrobenzene.—Bjerre reports three cases of simultaneous accidental poisoning of which one was almost immediately fatal and two patients recovered. Treatment consisted in abundant and continued lavage of the stomach together with infusion of solution of sodium chloride and administration of stimulants and purgatives; oils, milk and alcohol are contraindicated as promoting resorption. There were marked symptoms of a grave toxic effect on the blood, with pronounced cyanosis and rapid onset of anemia. The results of spectroscopic examination of the blood showed inconsiderable amounts of methemoglobin in the one case and none in the other.